

THE ATHENÆUM

Journal of English and Foreign Literature, Science, the Fine Arts, Music and the Drama.

No. 2551.

SATURDAY, SEPTEMBER 16, 1876.

PRICE
THREEPENCE
REGISTERED AS A NEWSPAPER

BETHNAL-GREEN BRANCH MUSEUM.—The COLLECTION of PICTURES, so well known as the DULWICH GALLERY, has been lent by the Governors, while the Gallery is under repair, to the Bethnal Green Museum, and is now OPEN to the Public. The Museum is Open Free on Mondays, Tuesdays, and Saturdays, from Ten A.M. to Two P.M., and on Wednesdays, Thursdays, and Fridays (Students' Days), from Ten A.M. to Six P.M., on payment of 6d. each person.

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SESSION, 1876-7.

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August, 1876. Secretary to the Council.

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SATURDAY, SEPTEMBER 16, 1876.

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Some Account of the Parish of St. Clement Danes (Westminster), Past and Present. Compiled from Various Sources, by John Diprose. 2 vols. (Diprose & Bateman.)

THE earlier published of these two volumes bears the date 1868, and is not marked Vol. I. except on the back. The later published volume is dated 1876, and has both on the back and title-page "Vol. II." The latter volume is supplementary to the former, containing all the new matter which the compiler could gather since the year 1868. In spite of a good deal of confusion, and of matter that is often extraneous to the subject, this compilation is not without its uses and its value. It is, certain drawbacks excepted, a welcome contribution towards the history of London.

St. Clement Danes is one of those "bits" of Westminster, rather than of London, which have fallen from their high estate. The dust of Danish kings is said to be mingled with its soil, and the original Ecclesia Clementis Danorum is further said to have been built for those Danes who, married to English women, were not driven out of the kingdom, and to whom was assigned for their dwelling limits that piece of land which is enclosed within the St. Clement's oval!

In the ancient church edifice many an infant of noble blood was baptized, and under its shadow many a remarkable personage found a grave. After Montacutes and Nevilles and Plantagenets had borne the title of Earls of Salisbury, it was conferred on a Cecil, and the first earl of that family name was, when an infant, there held at the font, in 1563. That roistering gentleman and free-and-easy dramatist, Sir Charles Sedley, and the graver Shaftesbury of the once much-lauded 'Characteristics,' were also christened in the old church. Here Ben Jonson buried his Knight of Knights, "glad-mentioned" (Sir John) "Roe"; but in none of the so-called "epigrams" or elegiac verses on Roe has Jonson made any allusion to the traditional story that Sir John died, in Ben's arms, of the plague. Indeed, the plague-stricken seldom, if ever, died in friendly arms. It was in St. Clement's that Dr. Donne buried his wife, and preached her funeral sermon to the text, "Lo, I am the man that have seen affliction." This was in 1617, about three years before he gave his daughter (if Mr. Collier's story be correct) to Alleyn the player. And, à propos to players,

John Lowen was buried here in August, 1653. But how Lowen came to lie there is not easy to explain, for dramatic story teaches that when the Puritan Government cleared the houses of audiences and actors, and stamped the drama out, as it was thought, for ever, "lusty Lowen" clapped on an apron, and appeared, with well-merited success, as landlord of the Three Pigeons at Brentford. Two or three years before the old church was taken down, one of the queerest of the "authors" of the day was here laid to his rest, namely, that Marchmont Needham who wrote the "Mercuries" during the Civil Wars. He was so impartial, or so indifferent, that he wrote those "Mercuries" on both sides, both for and against the King! This is the tradition, but it can be partly explained. As the author of "Weekly News-books," Needham was like some of the contemporary poets, he changed sides as circumstances changed; but, as he did not turn his coat in time for the Restoration, he went into exile, although he was ultimately allowed to return. The versatile fellow set up as a physician in Devereux Court, where he followed the fashion of his patients by one day dying. His friends had only to carry him across the Strand to put him in "consecrated ground." But the event which most nearly connects past times with the present was the brilliant one which occurred exactly two hundred years ago—in 1676. On a morning of "chill October" in that year, there stood before the altar of St. Clement's, Mary Davies, the daughter and sole heir of the wealthy Alexander Davies, of Ebury, Middlesex. At her side was her bridegroom, the moderately endowed Sir Thomas Grosvenor, Bart. But he had wedded a bride, who brought into the Grosvenor family not only the great Pimlico property, but that wherein the marriage is illustrated by the names of Davies Street and Grosvenor Street and Square.

The present church was built in the last decade of the seventeenth century by Pierce, superintended by Wren. The one great figure connected with it is that of Dr. Johnson, who appears as ostentatiously prominent in his pew as when he sat, in a gold-laced scarlet waistcoat, in a side box at the play. The church history of the parish is well told, and there is a good deal of it. Indeed, much the same may be said of the other histories here narrated. It could not be otherwise, for in the parish of St. Clement Danes great personages, those who make history, have lived. Among them may be reckoned nobles, ecclesiastics, philosophers, patriots, conspirators, authors, and players. These form a most motley crowd, and we may include among them some of the builders-up of the modern newspaper press. In details so numerous and varied, occasional errors may be expected. Accordingly, wonderful are some of the items of information contained in these pages. As examples, we may state that, under the date 1715, it is recorded that the parish Jacobite mob carried about with them the figure of "the infant Pretender." At the above date, this likely infant was seven and twenty years of age. Garrick is set down as dying in 1799, in which year he had been above twenty years "out of the story." Marvellous, indeed, are many of the dramatic incidents here recorded, quite as much to be relied on as the story in which it is chronicled

that "About this time" (no date given) "Madame Vestris was unfortunate enough to attract the notice of George IV., whose too rigid attentions annoyed her considerably (!). One night he seized hold of her under the piazza of His Majesty's Theatre, and tried to take her away in his carriage, but was prevented by her mother and attendant." On the other hand, there is no lack of simple heroic truth connected with the lives of some of the humblest of the humble classes who have lived in this home of the humble. Witness the poor widowed tailor who, condemned to the gallows for some petty larceny, an offence which incurred the same penalty as murder in those by-gone days, passed the time in Newgate, between the day of his conviction and the monthly hanging day at Tyburn, in making nine suits of mourning for his nine little children. The very thought of such an incident makes the heart ache even now; and there are other incidents of the lives of the poor here, only secondary in interest to the above.

Mr. Diprose has not omitted to state that Guy Faux and his fellows met "behind St. Clement's"; but he has forgotten to note that it was from the old Angel Inn the audacious son of the York proctor walked one November evening, with cloak on shoulder and lantern and matches beneath it, with the purpose, as the song says, of blowing up "the House of Lords, the King, and all the ministers"; and no doubt, as the same lyric observes, "His will was good to do the deed, if only they'd ha' let him." Other historical personages figured at the Angel, that quaint galleried inn, which is remembered by very many yet living. For these, we must refer the curious to Mr. Diprose's pages. In taking leave of them, we will warn him against a too great readiness to draw inferences or to jump to conclusions. One of the drollest examples of this alacrity is to be found in the following reference to Christianity and Mr. Smith (the first inhabitant of the parish that ever sat in Parliament—he represents Westminster):—"His regard for Christianity is testified by his having been for a length of years one of the Treasurers of the Society for Promoting Christian Knowledge."

Choyce Drollery: Songs and Sonnets. Being a Collection of divers Excellent Pieces of Poetry, of several Eminent Authors. Now first reprinted from the Edition of 1656. To which are added the Extra Songs of 'Merry Drollery,' 1661, and 'An Antidote against Melancholy,' 1661. Edited, with Special Introductions and Appendices of Notes, Illustrations, Emendations of Text, &c., by J. Woodfall Ebsworth, M.A. (Boston, Roberts.)

MR. EBSWORTH'S third and last specimen of the seventeenth century "Drolleries" is now before us, as well and perfectly edited as its two predecessors. All three have a strong family likeness, and yet each has its distinctive features, as Mr. Ebsworth shows us in his discriminating Introductions. It has been a real labour of love for the editor to lay before us these reprints, and we thank him very heartily for the pains he has taken to point out to us the real or presumed authorship of the several articles. Such a piece of work involves an intimate knowledge not only of the literary

characters of the age, but also of the political aspects, thoughts, feelings, and social characteristics of the period, especially as viewed from the Anti-Puritanical side. We have no great sympathy ourselves, we need scarcely say, with the majority of the roistering Cavalier ditties embodied in these three "Drolleries," and still less can we dare apologize for the coarseness of expression which is their general characteristic feature. Even in the love songs some exquisitely fine thoughts in one stanza are spoiled by an obscenity of expression in the one next following, which must shock every true lover of erotic verse. Some of the pieces appear to disdain even any attempt at decency, and are simply provocatives to lust. Still we should not be able, without such examples as these before us, to estimate rightly the condition of our England at the time when such works were produced. The editor, we are happy to perceive, at the same time that he is an enthusiastic antiquary, writes always like a Christian gentleman, and warns us against receiving any of the objectionable pieces as stamped with his approbation. Indeed, he even goes further, and continually reminds us that we must take such things as deplorable lapses from straightforward morality, and all the more deplorable as likely to occur again, were we to restrain religion, politics, and ethics within limits of too circumscribed a kind.

With respect to the present 'Drollery,' printed in 1656, when Oliver, Lord Protector, was in the ascendant, it is not at all surprising to learn that it was proscribed by the authorities, it was so clearly reactionary in its tendencies, so imbued with Royalist sentiments. The time was fast coming when the king was to have his own again, and old Oliver, as he was called—yet not so old, after all, for he was only fifty-eight years of age when he died on September 3rd, 1658—must have been naturally uneasy about the appearance of the book, and have given directions that it should be suppressed.

"Not easily was the book obtained," says Mr. Ebsworth, "every copy at that time being hunted after, and destroyed when found, by ruthless minions of the Commonwealth. A Parliamentary injunction had been passed against it. Commands were given for it to be burnt by the hangman. Few copies escaped when spies and informers were numerous, and fines were levied upon those who had secreted it. Greedy eyes, active fingers, were after the 'Choyce Drollery.' Any fortunate possessor, even in those early days, knew well that he grasped a treasure which few persons save himself could boast. Therefore it is not strange, two hundred and twenty years having rolled away since then, that the book has grown to be among the rarest of the "Drolleries." Probably not six perfect copies remain in the world. The British Museum holds not one. We congratulate ourselves on now restoring it to students, for many parts of it possess historical value, besides poetic grace, and the whole forms an interesting relic of those troubled times."

The editor proceeds to mention the kind of pieces contained in the 'Choyce Drollery,' among which occurs that 'On the Time-Poets,' so well known, by Thomas May, commencing—

One night the great Apollo, pleas'd with Ben,
Made the oddie number of the Muses ten;
The fluent Fletcher, Beaumont rich in sense,
In complement and courtships quaintness;
Ingenious Shakspeare, Massinger that knows
The strength of Plot to write in verse and prose, &c.

Such lines as these would not so much alarm the authorities as the following, reprinted from the 'New Year's Wish,' of 1638—"when the North was already in rebellion, wherein men read what at that time had not been deemed profanity or blasphemy, the praise and faithful service of some hearts who held their monarch only second to their Saviour. Referring to their hope that the personal approach of the king might cure the evils of the disturbed realm, it is written:—

You, like our sacred and indulgent Lord,
When the too stout Apostle drew his sword,
When he mistook some secrets of the cause,
And in his furious zeale disdain'd the lawes,
Forgetting true religion doth lye
On prayers, not swords against authority:
You, like our substitute of horrid fate,
That are next him we most should imitate,
Shall like to him rebuke with wiser breath
Such furious zeale, but not reveng'd with death.
Like him, the wound that's giv'n you straight shall
heal,
Then calm by precept such mistaken zeale."

No wonder that utterances like these caused the 'Choyce Drollery' to be rigidly suppressed.

Of the 'Antidote against Melancholy,' here also reprinted, and which doubtless gave occasion to the title of Tom D'Urfey's famous 'Pills to Purge Melancholy,' Mr. Ebsworth remarks:—

"A pleasant book it appeared to Cavaliers and all who were not quite strait-laced. It is almost unobjectionable except for a few ugly words, and bears comparison honourably with 'Merry Drollery' and 'Wit and Drollery,' both of the same date, 1661. Unlike the former, it is almost uninfected with political rancour or impurity. It is a jovial book that roysters and revellers loved to sing their catches from; nay, if some laughing nymphs did not drop their eyes over its pages, we are no conjurers. A vulgar phrase or two did not frighten them."

This collection, among many rare pieces, contains 'The Ex-aleation of Ale,' 'The Marriage of Arthur O'Bradley,' 'An Old Song of an Old Courtier,' and the famous 'Green Gown.'

In conclusion, we trust to meet with Mr. Ebsworth again, not merely as editor of such old pieces, but as an original author, whose own "trick of verse," as shown in his preludes and epilogues to these volumes, points him out as one capable, with due care, of adding his name to the list of living English poets.

Finger-Ring Lore: Historical, Legendary, Anecdotal. By William Jones. With numerous Illustrations. (Chatto & Windus.)

RINGS may be said to be a subject of wide and varied interest, from the "engaged ring," and the bridal wreath in prospect, of the girl who fancies that life is made up of more pleasures than duties, to the knuckle-duster, with the neck-circlet looming not far away, of Mr. William Sikes, whose ideas of life are not altogether different. It is a subject which has been illustrated by the literature of all civilized countries, in both prose and verse. Some one and twenty years ago, Messrs. Triebner & Co. published an American contribution to this sort of lore, in 'The History and Poetry of Finger Rings,' the author of which, a lawyer named Edwards, had no cause to be dissatisfied with the reception of his work in this country. Sixteen years ago, Madame de Barrera's volume on 'Gems and Jewels: their History, Geography, Chemistry, and Ana,' was published by the late Richard Bentley, and was found to add to

the history of what was worn in rings, something worth knowing. Perhaps the most exhaustive of English books in this rich department of literature is Dr. Billing's 'Science of Gems, Jewels, Coins, and Medals,' published by Messrs. Bell & Daldy in 1857. It took a wide sweep, and went off at a tangent to all sorts of subjects connected with the main one, but always in a pleasant and instructive manner. But, dealing with the bibliography of gem and ring literature, we must not omit two works by the Rev. C. W. King, M.A., viz., 'The Natural History, Ancient and Modern, of Precious Stones and Gems, and of the Precious Metals,' also 'Antique Gems: their Origin, Use, and Value,' the latter published by Mr. Murray, the former by Messrs. Bell & Daldy. These two are important, solid, standard works, to be consulted with perfect reliance. We will add to the list a volume published by the predecessor of Messrs. Chatto & Windus, 'Diamonds and Precious Stones,' by Harry Emanuel. We are the more careful to name these works, as we do not find them in the Preface of Mr. Jones's volume. A graceful notice of labourers who have gone before is always pleasant to find in the writings of workers who have followed in the same path. However, in the course of his chapters, Mr. Jones is never backward in acknowledging the sources whence he derives his own gossiping materials, and in reading these chapters and marking these acknowledgments, we have been struck at the endless supply of matter that compilers find in our contemporary, *Notes and Queries*. That periodical seems to be a quarry from which every digger can extract some ore useful for his especial purpose.

There is not such a "craze," perhaps, for rings as for blue and other china, or for antique silver, but there is a certain "rage" for them among a limited class of collectors. These are told in vain that in all these matters there is a downright roguesery. There are, no doubt, fair dealers and genuine articles, but the unfair can supply counterfeits, often undetectable even by experts, and not even suspected by the simple-minded purchaser. If the history of china-ware could be written by a reformed rascal who had trafficked in that commodity, it would excite the greatest disgust in the bosoms of buyers and amusement among non-purchasers. The rarest and most expensive ware can, we are informed on very good authority, be made to order. That dragon china which, it was said, could not leave China without a sign-manual permission from the Emperor, was for a long period painted on the China clay by a London workman artist, whose name is well known. As for the attesting marks, they are not necessarily of more value than the Hall marks on silver, which stamp modern work and material with the forged mark of antiquity. So with rings. We know that an oval intaglio, bedded in an oval setting, was the fashion of ring worn by the Roman emperors; but let not him who buys an ancient-looking object of this sort conclude that it was once dignified by clasping the finger of Augustus. Imperial oval rings will continue to be furnished as long as there is a demand for them. Again, antiquestatuettes are things not to be bought in a hurry. We lately heard of a very eminent statesman who, being an indifferent judge as a collector, gave a good sum for an antique statuette, so uncommon, that he sent it where he hoped some

one could identify the age of the manufacture and the name of the person represented. The porter of the establishment, in the course of his "dusting," came on this ancient object, and immediately recognized the work of his own hands: "I did that," said he, "bad as it is, when I was trying my hand at modelling at So-and-so, the plaster sculptor's!" Again, a victim tells us of his purchasing at Ceylon antique chains and rings, warranted to have been made for and worn by Ceylonese potentates in almost pre-historic times. On showing them afterwards to a London goldsmith, he had the satisfaction of hearing that that very goldsmith's house had furnished them to order for Ceylonese customers.

To return to Mr. Jones's book, we have to say that it is one of those gossiping books which are as full of amusement as of instruction. The latter might be somewhat fuller. Thus, Serjeants' rings now belong to history. All, or nearly all, that Mr. Jones tells us here of the serjeants and their rings is derived from *Notes and Queries*. We may say, in addition, that of late years, barristers on being made serjeants, were not so profuse in ring giving as of old. One was always sent to the Queen, who, it is understood, took great interest in the matter. If there was much delay in forwarding the thick, butter-tub shaped circlet, a reminder was sure to be communicated by way of "whip"; and, with this interest in view, we are reluctant to believe that these mementoes of the past and tokens of the rise of meritorious men have been melted down and converted into a gold candlestick. We hope that all the mottoes have been preserved. On the elevation of Serjeant Parry to the well-deserved honour of the coif, his lighter-minded friends suggested for his motto, "Le Jugement de Paris," "Je parie que oui!" and other merry conceits; but we believe that grave and learned gentleman chose the legend, "Lex et Grex," which may be taken to be a sort of free-and-easy Latin, implying "Me and my Clients." As an example of the miscellaneous contents of this book, the following may be taken:—

"In opening ancient sepulchral barrows plain or jewelled rings have, in many instances, been found, which, perhaps, a widowed wife or widower took from their fingers, and flung, in the intensity of their grief, into the graves of those they mourned. A modern instance of this is given in the *Times*, of October 28, 1865, when, at the funeral of Lord Palmerston in Westminster Abbey, the chief mourner (*sic*), the Rev. Mr. Sullivan, as 'a precious offering to the dead,' threw into the grave several diamond and gold rings. Small rings are frequently met with on the breasts of mummies. At the excavations at Veii and Preneste, by Padre Raffaele Garucchi, a great quantity of tiny rings of yellow and blue enamel were found, of a similar character to those mentioned."

Of some famous diamonds of modern times, we have the following:—

"An anecdote connected with the celebrated 'Pitt' diamond is related by Mr. Eastwick, and shows how important results may sometimes be secured, when reason and logic may not prevail. This jewel passed through some curious adventures, and, after having ornamented the sword of Napoleon at Waterloo, was sent as a present in a ring by George the Fourth to the Sovereign of Persia, Fath-Ali-Shah. The bearer of this costly ring, Sir Harford Jones, was stopped in his journey by a messenger from the court, and desired not to enter the capital, where French interests were then paramount. After Sir Harford had exhausted every argument to show that he ought to

be received, without making any impression on the Persian Khan, he said, 'Well, if it must be so, I shall return, but this must go with me,' and he took from his pocket the beautiful diamond ring which had been sent for the Shah. The sparkle of the gem produced a magical effect; the Khan no sooner beheld it than he lost his balance, and fell back from his seat quite out of breath; then, recovering himself, he shouted, 'Stop, stop, Elchi! May your condescending kindness go on increasing! This alters the matter. I will send an express to the heavenly-resembling threshold of the asylum of the world! I swear by your head that you will be received with all honour. Mashallah! it is not everyone that has diamonds like the Inglis.' He was as good as his word; the express courier was despatched, and Sir Harford Jones entered the city of Teheran by one gate, while General Gardanne, the French envoy, was packed off by the other. [This stone must have been a fraction or portion of the cutting of this famous diamond, as the 'Regent' is still in the French *Garde-meuble*, or national treasury.]"

With this, we commend the handsome volume to our readers; and remark that it would not have been quite so extensively paged but for the many passages from *Notes and Queries*.

The Principles of Hebrew Grammar. By J. P. N. Land. Translated from the Dutch, by Reginald Lane Poole. (Trübner & Co.)
Catechism of Hebrew and Chaldee Grammar. By the Rev. P. Mercer. (Melbourne, Walter, May & Co.)

THE crop of Hebrew grammars grows apace, notwithstanding the many hundreds which have appeared within the last and present century. The phenomenon is hardly a pleasing one to the scholar already acquainted with those of Gesenius, Ewald, Olshausen, and Boettcher. If he be disposed to be contented with these, he will not desire to be distracted by others. Yet professors and teachers are prone to try what they can do in the way of grammatical compilation, thinking that their pupils and others can be more profitably instructed by their own than by foreign works.

The grammar of Prof. Land does not belong to the ordinary class. It aims at originality, and is unlike its predecessors. Discarding the commentaries of grammarians on the pointed text, the author falls back on the text with its points alone, and attempts a revision of the whole grammatical system, based upon a comparison of the given phenomena with one another, as well as with those observable in other languages. Thus he endeavours to emancipate himself entirely from the supremacy of the mediæval theory, and to complete the reform which had been, to a great extent, effected by Ewald and Olshausen. Such procedure reduces the whole grammar to rule, to a greater extent than it had been before, simplifying points hitherto obscure, and accounting for modes of human speech philosophically.

There are two leading features of the work to which the author himself directs special attention in the Preface. One is the treatment of vowels. The new doctrine set forth is that the original vowels, A, I, U, with the diphthongs, AI, AU, were both long and short. But changes soon occurred,—the first tending to equalize the duration of syllables, and to lay a stress on the end of each word; the second, to give a distinctive colouring to lengthened sounds, by using the mixed vowels for the purpose; the third, to introduce the

modern colouring of vowels in place of the original distinction of quantity which had disappeared. Here the remaining vestiges of different lengths of syllables were strained by the Jewish grammarians into comparison with the primitive quantities preserved in classical Arabic. Instead of this, Prof. Land uses the old Arabic as a key to the original Hebrew; and parallels the language of the vowel points with vulgar Arabic and Syriac.

This doctrine is ingenious, and deserves consideration; but its correctness is doubtful. There may be more truth in the tradition of the Hebrew grammarians than the author is willing to allow: to discard it altogether seems rash. The reform of pronunciation which he advocates will not be adopted generally. According to it, we are to pronounce the plural *Oyebim* (enemies), 'AYIBIM, and *Yoledoth* (parents), YALIDAT; short *o* is represented by *u*, and *u* by *t*; *z'kenim* (old men) is ZAKINIM, and *g'vohoth* (high ones) is pronounced GABUHAT. Surely this innovation does not commend itself, even if it rests on a right theory.

A second chief feature is the recognition of case-endings in ancient Hebrew, with M or N as an essential constituent. By this the author gets rid of certain connecting vowels, *He* paragogic and *Nun* epenthetic. It is difficult to accept this theory, even after Philippi's exposition of it. The objections to it are obvious.

The volume consists of two parts, treating of sounds and words. The third part, relating to sentences, is unpublished. This method of publication is objectionable, because works are often left incomplete, especially by foreigners. Olshausen's grammar is an example. Its author has lived many years since he wrote the first volume, and has never finished the treatise. Dr. Land should have given the public the whole of his book together. The present portion was published in 1869, and may be considered, as far as the translation is concerned, a second edition, because the author has himself revised the work and added to it. Fragmentary as it is, we are glad to have it; for it possesses an independent value. Marks of acuteness and ability distinguish it throughout. It will arrest the notice of scholars, and suggest new ideas. Unfitted for learners, at least in England, it may be very useful to such as have made some progress in Hebrew. Disagreeing as we do in various respects with the author's notions, we have much respect for his original and philosophic expositions, his plausible conjectures, and simplifying processes. There is no doubt that he has emancipated himself entirely from the supremacy of traditional Hebrew grammar; but he has gone too far in the path where Olshausen himself hesitated and stopped.

Prof. Mercer's *Catechism of Hebrew Grammar*, which has the addition of a Chaldee part, is termed *initiator*, because it is intended for mere beginners. Thinking that Gesenius's school-grammar presents a most discouraging appearance to the tyro, he dictated the present one to his students, and wrote it out for their use. According to his own statement, he "consulted every grammar worth consulting, from the treatises of R. Jehudah Chayug to Pinnock's *Catechism*." The form of question and answer is not a good one; but the statements are simple and clear. In many cases, the little book admits of improvement. The writer still retains the names of the tenses,

preterite and *future*, instead of *perfect* and *imperfect*; he divides nouns into two *declensions*, and speaks of *conjugations*. The practice of having *initiatory* Hebrew grammars cannot be commended, because he who desires to study the language must procure several books. It is much better to have a good grammar at first—one that is sufficient to supply all needs, such as Roediger's Gesenius. The knowledge derivable from a catechism like Mercer's is but small; whereas that obtained from a grammar like Gesenius's satisfies the great majority of Hebrew students, enabling them to read the Old Testament in the original language with understanding and ease. It is evident, however, that the Catechism of Pinnock, wretched as it is, has influenced the writer as to form; and that he has consulted a number of perfunctory publications which could only influence him injuriously. A smattering of Hebrew and Chaldee may certainly be got from the present Catechism; but what avails such smattering? It may, indeed, lead to ulterior study. If so, something has been gained. Such study, however, is unusual. The majority of expositors propound their expositions not from the original documents, but from translations; and should advanced criticism, based upon a competent knowledge of Hebrew, set forth what is new to the multitude, they reject it with traditional aversion.

The Lancashire Library: a Bibliographical Account of Books on Topography, Biography, History, Science, and Miscellaneous Literature Relating to the County Palatine. By Lieut.-Col. Henry Fishwick. (Routledge & Son.)

No one but a person who has himself undergone the drudgery, has any idea of the amount of time and patience required to make a good catalogue of even a very small collection of books. But few of the English private libraries, as far as we have been able to observe or ascertain, have any catalogues whatever. Their owners, in several cases we could mention, have proceeded some steps towards compiling one, but have found the work so laborious and uninteresting, that they have left off before anything useful has been accomplished. Yet a library without a catalogue is like a book without an index, or a literature without dictionary or grammar. It is, however, much less troublesome to compile a list of the books in any one library than it is to make a catalogue of those relating to a single county. In the former case, the workman has his materials at hand, all in one place, in the latter they are scattered over the length and breadth of England, and are not to be come at without long journeys or tedious correspondence. Col. Fishwick has certainly spared no labour. His collection is not perfect, however, but the omissions we have detected are entirely of tracts of slight importance. There are two things in the plan of the book which, in our opinion, render it less useful than it might have been. In the first place, "tracts, pamphlets, and sermons" relating to the county are not noticed when they are more modern than 1720. And, in the second, an endeavour has been made to form a classed catalogue. We are quite aware that, viewed as literature, the "tracts, pamphlets, and sermons" of the last century

and a half are, for the most part, of little value, but to the student of manners and local history they are most important, and they are just the sort of literature which does not get garnered in the great libraries. We know from experience the extreme difficulty of finding, or even learning the titles and dates of such things when their immediate interest has passed away. The example of a Lancashire author will illustrate what we say, although his published writings had none of them, we believe, any relation to his native county. The late Archdeacon Stonehouse (born in Manchester in 1793), the author of 'The History and Topography of the Isle of Axholme,' was a prolific writer, but most of his publications took the form of sermons, charges, and slight tracts. Not one of our copyright libraries has a complete set of his works, and we do not believe that the whole of them exist in any one private collection. To have catalogued such things as these would no doubt have increased the size of Col. Fishwick's volume, but it would have rendered it, at the same time, much more useful. The second objection we have to make is that an arrangement under classes has been attempted. The work has been carefully done, and no blunders occur like that in the catalogue of a subscription library in an important northern town, where Ruskin's 'Notes on the Construction of Sheepfolds' is put in the section devoted to agriculture; but though there are no absolute mistakes, many titles are entered where a person not familiar with the book, but consulting it on an emergency, would not think of looking for them. It would have been far better if the simple alphabetical order had been followed, and a classed index had been given, similar to the exceedingly good one to be found at the end of the last edition of the 'Catalogue of the London Library.' With the exception of a few misprints, the book seems to be accurate. We think, however, that if biographical notes were to be given at all, it would have been well if they had been somewhat fuller, and had more frequently referred to other sources of information. We are, however, extremely thankful for one of them, by aid of which all persons not invincibly careless may hereafter distinguish between John Whitaker, the author of the 'History of Manchester,' and the antagonist of Gibbon, whom Lord Macaulay brands as being "as dirty a cur as I remember" ('Life,' ii. 285), and Thomas Dunham Whitaker, the historian of Richmondshire, who was a really scholar-like person, and one of the very few antiquaries of his day with wide views, and who understood the connexion between mere parish details and political history. The two men, between whom there were the fewest possible points of resemblance, beyond the fact that they were both called Whitaker, both in holy orders, and both wrote books, are constantly confounded, to the no small injury of the well-earned fame of the latter.

Under the heading of West's 'Antiquities of Furness,' there is a note which seems to contain an error. It runs thus, "Thomas West was a lay priest of the Society of Jesus, and afterwards a guide to the Lakes." A lay priest is surely a contradiction in terms. Is not lay brother what is meant? or does it signify that he was a priest attached to the

order, but not what is called a professed father?

A Dictionary of the English Language. Abridged by the Editor from that of Dr. Samuel Johnson, as edited by R. G. Latham, M.D. (Longmans & Co.)

SINCE the Archbishop of Dublin published his tract, 'On some Deficiencies in our English Dictionaries,' in 1857, compilers and editors of dictionaries have been expected to possess some idea of what a dictionary should be, what it should contain, and what omit. Unfortunately, Dr. Latham has failed to profit by the Archbishop's remarks, and this book contains examples of almost every possible fault that a dictionary-maker can be guilty of. 1. Its etymologies are insufficient—words like *interloper*, *less*, *loose*, *mete*, have none at all. 2. Its definitions are often clumsy, sometimes wrong, and sometimes miss the point. 3. It registers both obsolete and technical words incompletely and capriciously. 4. It omits meanings of words. 5. It retains unnecessary quotations for some obsolete word when the space they take up is wanted for fresh matter. 6. It pays too little heed to constructions and synonyms.

To give instances: 1. *Taunt* is derived from Fr. *tanser*, without accounting for the final *t*; *fault* is derived from Fr. *faute*, instead of the older *faulte*; *fey*, faith, from Fr. *foi*, instead of the older *fei*; while, as has been said, many important words are left without any etymology at all.

2. (a.) Here is the definition of tattoo, which reads like a direction from a 'Boys' own Book':—

"*Tattoo*, v. a. (?) Puncture the skin, and insert in the puncture some colouring matter, so as to leave a stain; the colouring, perhaps, is not essential, as in some countries the process consists in merely raising the skin; generally, the marks are arranged in figures, sometimes in such a manner as to serve for a badge of the tribe or family so marked." See also *go*, *Philistine*, *Pilgarlic*.

(b.) "*Snaffle* [Dutch, *snavel* (no hint that this means *snout*)]. Bridle which crosses the nose," a definition which has nothing to do with the speciality of a snaffle as many curb bridles cross the nose, and many snaffles do not.

(c.) "*Ombre*, s. [Spanish, *hombre* (no hint that this means *man*, and that the game is so called because the *man* who challenges to win the pool is the *hombre*), game of cards played by three." "*Quickbeam*, s. See extract, '*Quickbeam*, a wild sorb, by some called the Irish ash, is a species of wild ash, preceded by blossoms of an agreeable scent'—*Mortimer, Husbandry*," with no hint that the tree originally called *quick*, alive, was the aspen, *Alfric's* "*tremulus*," from its slender-stemmed, shaking leaves, and that the name was then transferred to "the wild service or roan tree, probably through some confusion between *civic* and *vicce*, and the roan being regarded as a preservative against witchcraft."—R. C. A. Prior. 3. The Dictionary registers Spenser's *belive*, *uite*, but leaves out his *foredamned*, *forhent*, &c. It contains Shakspeare's *wappen'd*, but not his companion *unwapper'd* of 'The Two Noble Kinsmen,' which explains it. It enters the obsolete *oxyrrhodine*, and omits the current *oxytone*,

and so on. 4. It has Shakespeare's "feed, supply with food, nourish," but not his "feed, delight" ("cannot feed mine eye"); it leaves out his *craft*, ("Cor.' IV. vi. 118; *inch*, island, 'Macbeth' I. ii. 61; *incivil*, 'Cymb.' V. v. 292; *wonder'd* ("so rare a wonder'd father," 'Temp.' IV. i. 123, &c. 5. A word like *decumbiture* has two quotations; *dedolent* one, and that long; while Shakespeare's *deem*, *s.* has none, and Jeremy Taylor's *digested*, ripened ("well digested fruits," Trench, 'Sel. Glos.') is left out. 6. Under *allow*, Shakespeare's "allow of" is not noticed; nor under *adopt*, his "adopt to"; nor under *compare*, his "compare to," as well as "with," &c. *Docile* and *docible* are still treated as the same, notwithstanding Dr. Trench's protest, backed by his quotation from Hacket, "Whom Nature hath made *docile*, it is injurious to prohibit him from learning anything that is *docible*," &c. As an instance of the occasional wordiness of Dr. Latham's comments, take his note on "a for an" in this "abridged" dictionary:—"It is used when the word that follows begins with the sound of a consonant, as a man, a stone, not an man, an stone. In words like *ever*, *unit*, and others, wherever the sound is that of the semi-vowel *y* (*yoo-er*, *yoo-nit*, &c.), *a* is preferred to *an*, though, so far as the spelling is concerned, they begin with a vowel."

Is it not clear that for all the words after *stone*, "a ever, a unit," would have been enough; and then there would have been room for some of the meanings of *a* that Dr. Latham unfortunately omits, as Shakespeare's *a=one*, *a=each*, *a=on*, *a=of*, *a=in*, *a=have*, *a=he*; the prefix *a*, &c. As a working dictionary for general reference, Dr. Latham's abridgment will certainly not displace Webster's. Its vocabulary is smaller; its etymologies more deficient; it makes less attempt to mark the pronunciation; it has no woodcuts; though, on the other hand, it does spell *favour* and such words, with *our*, and not *or*, like Webster's "favor (also written favour)."

Dr. Latham in his historical Sketch of the English Language has used Dr. Morris's and Dr. Murray's dialectal material, and his account is, therefore, an advance on the Sketch in Webster, but it does not contain the Webster paradigms, principles of pronunciation, &c.

FRENCH NOVELS OF THE LAST FIVE MONTHS.

La Comtesse Hedwige. Par Henry Rey. (Paris, Amyot.)
Un Coin du Monde. (Paris, Calmann Lévy.)
Scènes de la Vie Cruelle. Par Charles Monselet. (Same publisher.)
Le Legs de Cain: Nouveaux Récits Galiciens. Par Sacher-Masoch. Traduits par Th. Bentzon. (Same publisher.)
Marguerite de Keradec. Par Jules de Carné. (Same publisher.)

We cannot speak well of the French novels which have appeared during the summer. The first two upon our list are those which have been the most largely sold:—of these, the former is dull and infamous, while the latter is only dull and questionable. We wonder that 'La Comtesse Hedwige,' stupid as it is, has hitherto escaped a prosecution:—it is a book which, with a hypocritical profession of morality, stands lower than even any successful novel of the Second Empire. 'Un Coin du Monde' is by a lady moving in French society:—it is told exclusively in dreary letters, in which are related facts not usually told to friends. 'Scènes de la Vie Cruelle' are short

stories, of which the first are on sad subjects. These are wearisome, but a few comic stories, lost here and there among the others, are excellent, as for instance one of a funeral, and one (rather broad) describing how matters would have passed between the author and Lucretia, had the author only been Tarquin for half an hour. The stories in the second half of the volume are all comic, and, though not suited for all readers, are full of admirable fooling. The next volume is also one of short stories, but stories of a very different kind. In Sacher-Masoch the Ruthenians and Little-Russians think that they have found the Tourguénief of the southern Slavs. This new series of Galician tales is, however, less good than was the former one. 'Marguerite de Keradec' is a novel which begins where English novels end, with the marriage of two charming young people: it is a powerful tale of jealousy.

OUR LIBRARY TABLE.

THE Religious Tract Society send us *American Pictures, drawn with Pen and Pencil*, by Dr. Manning, a Nonconformist minister, if we mistake not. It will be found a pretty drawing-room table volume, and its illustrations will please children much. The author's views are broad and tolerant.

MR. WYLD, of Charing Cross, sends us a new Ethnological Map of Turkey. We cannot praise it. It seems intended to show that Turkey contains no Turks. It counts the Bulgarian nation as "Slavonians," by which it seems to mean "Slavs," which they certainly are not. It gives nearly all Hungary to the Magyars and German colonists, ignoring the Slavs, who are the majority in many parts even of the centre of Hungary proper. Great trouble has been worse than wasted on this map.

We have on our table *Transactions of the Historic Society of Lancashire and Cheshire*, 1874-5 (Liverpool, Holden).—*Trans-Continental Route Illustrated, crossing the Switzerland of America* (Union and Central Pacific Railway Co.).—*Round About Bradford*, by W. Cudworth (Bradford, Brear).—*Posthumous Papers*, by Rev. O. P. Hiller (Speirs).—*The Book of Menus*, 1876, by Fin-Bec (Grant).—*A Parent's Manual for the Religious Training of Children*, by Rev. U. Z. Rule (Gardner).—*The Morning Star*, by E. F. de C. B. (Gardner). Among New Editions we have *A Practical Method of Acquiring the German Language*, by Dr. E. Pick (Trübner).—and *Biographical Sketches, 1852-1875*, by H. Martineau (Macmillan).

LIST OF NEW BOOKS.

Law.
Coe's (W. E.) Practice at the Judges' Chambers under Judicature Act, cr. 8vo. 10/6 cl.
Indermaur's (J.) Principles of the Common Law, 8vo. 50/ cl.
Nicoll and Flaxman's Law of Parliamentary, &c., Registrations, cr. 8vo. 7/6 cl.
Thomas's (E. C.) Leading Cases in Constitutional Law, 6/ cl. 1p
Fine Art.
Aladdin's Picture-Book, illus. by Walter Crane, 4to. 5/ cl.
Parker's (J. H.) Archaeology of Rome, Part 7, 8vo. 10/6 cl.
History.
Albert the Great, his Life and Labours, by Dr. J. Sighart, 12/ Kelly (Rev. J.), a Memorial, 8vo. 1/6 s/wd.
Geography.
Schuyler's (E.) Turkistan, 2 vols. 8vo. 42/ cl.
Smith's (D. M.) Arctic Explorations, Vol. 2, 4to. 15/ cl.
Philology.
Kinloch's (A.) Compendium of Portuguese Grammar, 4/6 cl.
Ravensberg's (A. von) Student's First Year's German Companion, 12mo. 2/6 cl.
Science.
Dalton's (Rev. T.) Rules and Examples in Algebra, Pt. 2, 2/6
Fleming's (G.) Text-Book of Veterinary Obstetrics, Part 1, roy. 8vo. 2/6 s/wd.
Meredith's (J.) Treatise on the Grape Vine, 4to. 7/6 cl.
General Literature.
Adams's (W. H. D.) Threshold of Life, 12mo. 3/ cl.
Dodge's (M. M.) Theophilus and Others, cr. 8vo. 10/6 cl.
Downes's (M. F.) Handbook of Artillery for Auxiliary Forces, 32mo. 2/6 roan.
Engel's (C.) Musical Myths and Facts, Vol. 1, 8vo. 6/ cl.
For Better, for Worse, edited by E. Yates, 12mo. 2/ bds.
Forster's (W. T.) The Weirwolf, cr. 8vo. 5/ cl.
France's (M. C.) Woodleigh Park, cr. 8vo. 5/ cl.
Jones's (W.) Finger-Ring Lore, cr. 8vo. 7/6 cl.
Last Act (The), Funeral Rites of All Nations, &c., collected by W. Tegg, 12mo. 5/ cl.
Major Vandermere, by Author of 'Ursula's Love Story,' 3 vols. cr. 8vo. 31/6 cl.
Minister's Chart of Autumn and Winter Fashions, 1876-77, 12/6
Paget's (F. E.) Homeward Bound, cr. 8vo. 4/ cl.

Phillips's (J. R.) Remarkable Providences, cr. 8vo. 2/6 cl.
Prentiss's (E.) Story of the Percy, cr. 8vo. 2/6 cl.
Rhodes's (J.) Our Visit to Rome, 16mo. 2/6 cl.
Weir's (M. E.) Learn to Labour and to Wait, 12mo. 2/6 cl.
White Cross and Dove of Pearls, by Author of 'Selina's Story,' 8vo. 9/ cl.

POETRY.

"And they heard the voice of the Lord God walking in the garden in the cool of the day."—Genesis iii. 8.

Ah, the most ancient time,
When God and man were friends,
And earth was rounded with a summer clime,
And the dull doubt that lends
Sorrow to life was all a thing unknown.
Before those hours had flown
God walked at eventide thro' Eden's shade
And spoke to Man, and Man was not afraid.
Cannot that time return?
Is it not here, for those
Who from the strong still work of God can learn
His grandeur of repose?
A day with Him is as a myriad years,
A tear outweighs the spheres,
And as He walked 'neath Eden's mystic tree
In the cool eventide He walks with me.

MORTIMER COLLINS.

GRAY'S ELEGY.

The Vicarage, Sibford Gower.

PERMIT me to thank your Correspondent, who a few weeks back called attention to two or three departures from the original text of Gray's "Elegy," in the 'Annotated Poems of English Authors,' and to say that they were quite accidental, and shall be corrected without delay.

EDWARD T. STEVENS.

THE FALL OF BABYLON, n.c. 538.

32, Highbury Place.

IN Dean Stanley's interesting work on the Jewish Church, reviewed in the *Athenæum* of the 9th inst., he quotes from the Chaldee records that the King of Babylon had fled from his capital at the approach of the Persian army, and had taken refuge at Borsippa, on the Persian Gulf, where he was afterwards taken captive by the Persians. The Dean adds that the Jewish records know nothing of this. But I should like to be allowed to show that though neither King Nabonned, nor the town of Borsippa, are mentioned by name in the Bible, yet in three several places the Chaldee narrative meets with full confirmation.

First, Isaiah xxi. "On the desert of the sea," can only relate to the Persian Gulf. The nobles feasting there, at the time when Babylon was being besieged, may have been at Borsippa. There swift messengers arrive, bringing the news that "Babylon is fallen"; and the person whom they address as "my lord" is probably Nabonned, King of Babylon.

Secondly, Isaiah xlii. 14, mentions the capture of the fugitives among the seafaring Chaldees on the coast. Here the place meant can only be the Persian Gulf, where Borsippa was situated; and the fugitives may have included the king, as in chap. xxi.

Thirdly, Jeremiah li. 31, 32, says, yet more clearly, that the King of Babylon was at a distance when his capital was taken, and runner is sent to meet runner, and messenger to meet messenger, to tell him of the progress of the siege, how the fords are seized, and the reed-beds burnt with fire, and the city is being taken from end to end.

In all this there is no contradiction to what the Book of Daniel, and Xenophon's 'Cyropædia,' tell us, namely, that a king of Babylon was living in Babylon, and perished there when the city was taken. Nabonned and Belshazzar, father and son, were probably reigning jointly, as was customary in the east, and as was the case with Nabopolassar and his son Nebuchadnezzar.

SAMUEL SHARPE.

THE INTERNATIONAL CONGRESS OF ORIENTALISTS.

St. Petersburg, Sept. 8, 1876.

IN accordance with the arrangements announced in the programme, the Central Asian Section, under

the presidency of M. Schefer, met on Saturday morning at the Ministry of the Interior. Immediately on the *séance* being declared open, M. Sachau delivered a short address on Al-Biruni, and was followed by M. Tcharykow, who gave an interesting account of the expeditions of Pazoukhive in Central Asia in 1669-72. During the first of these expeditions the traveller visited Kiva, Bokhara, and Balkh, as envoy of the Tsar Alexis Mikhailovitch, and of this journey a full account exists in the archives of the Foreign Office at Moscow.

As soon as M. Tcharykow had descended from the tribune, Mr. Long rose with the intention of reading a paper on the Aryan race, but as it was written in English, and Mr. Long was unprepared to give a *résumé* of it in French, it was ruled by the President, in accordance with the *statuts définitifs*, to be inadmissible, and it was therefore at once handed over to the Committee of Publication. The same course was followed in the case of a paper on Asiatic cholera by Dr. Macnamara. M. Oppert next spoke on the subject of the Suso-Medes. He pointed out that these were neither a Semitic nor an Aryan race, and he entered into a somewhat lengthy disquisition on the grammar of their language, and on the written characters which they employed. After a short discussion between Mr. Howorth and M. Vasiliew on the origin of the name "Mongol," and some remarks by M. Grigoriev on the use of the term "Turanian," it was proposed and carried that the regulation confining the languages to be spoken at the Congress to French and Russian should be abrogated, and that any European language should be admissible. This having been agreed to, Mr. Long was allowed to read his paper, and the *séance* was brought to a close by a vote in favour of a proposition made by M. Schefer that the Congress should solicit the support of the Imperial Government for the publication of the Chronicle of Tabori.

On the same evening the Caucasian Section met, and in the absence of the President, M. Gamazow, M. Berger took the chair. In the course of the *séance*, M. Grigoriev spoke on the various emigrations which have taken place to and from the Caucasus, and pointed out the common error of supposing that the people known as Caucasian are the indigenes of the Caucasus.

At the meeting, on Monday morning, of the Turkish Section, M. Harkavy read a paper on a passage of Masoudy relating to the ancient history of the Slaves, and suggested the possibility that the king Madjek, of the tribe of Valinans, might be identical with Mousak of the Byzantine. Mr. Howorth followed with a very interesting paper on the Khazars, in which he demonstrated that they were a Turkish and not a Ugrian race. M. de Goeje then read a discourse on an Arabic manuscript which exists at Cambridge and which contains a history of the Abbassides of Al-Yakoubi, and M. Smirnow described a Turkish manuscript of the seventeenth century on the mythology of the Asiatic peoples. In a subsequent speech, M. Sachau argued strongly in support of the study of the scientific literature of the Arabs, and he pointed out the advantages which had already been derived from the publication by the Academy of St. Petersburg of the description of the fixed stars by Abderrahman-al. The importance of a study of the manner of life of the ancient Arabs as an exegesis of the Old Testament was also strongly insisted on by M. Stickel. The question of the causes which led to the sudden cessation of trade between the Mohammedan countries in the East and Northern Europe next gave rise to a discussion between MM. Grigoriev, Chwolson, Howorth, and Harkavy, after which the *séance* was brought to a close.

On Monday evening M. de Rosny presided over the Section of the extreme East, in course of which the antiquity of the Japanese records, which it was proved do not extend beyond the seventh century, and the ancient pronunciation of Chinese, formed the principal subjects of discussion. As regards the last point, M. Vasiliew pointed out that the book of odes formed the best criterion from which to judge of the sounds of the ancient language.

At the meeting of the Indian Section on Tuesday morning, M. de Gubernatis presented his work, entitled 'Matériaux pour servir à l'Histoire des Études Orientales en Italie,' and gave a brief sketch of the progress which has been made in Oriental studies in that country on the subject of the supposed affinity between the language of Afghanistan and the modern dialects of India. M. Tereniew then addressed the meeting, and pointed out, by a number of instances, the distinction between the languages of Afghan and Persia. This was followed by a discussion of some length on the history of the ethnographic names "Sarte" and "Tadjik."

On Wednesday morning the Transcaucasian Section assembled, and was presided over by M. Patkanow. M. Berger read a paper on some Adzerbidjan Songs, and M. Müllenhoff addressed the meeting on the Iranian origin of the Scythians of the Euxine and of the Sarmates, and on the identity of these peoples. The President then spoke as to the date of the geography attributed to Moses Chorenensis, which he put down as being about the beginning of the seventh century, on the authority of Léon Alishan and M. Kiepert. At the invitation of the President, M. Oppert made some remarks on the cuneiform texts written in the language of ancient Armenia. M. Eritsov followed on the same subject, and two papers on Georgian Fables and Georgian Laws, by MM. Tsagareli and Tchowbinow, brought the *séance* to a close.

Yesterday was a day of rest, and at the invitation of the Emperor, a large majority of the members of the Congress betook themselves to the Imperial Palace of Peterhoff. Before starting they were entertained at the Russian club at a *déjeuner*, and they then embarked on board an Imperial steamer, which landed them on the shores of the Gulf opposite the palace. Here they were met by carriages, which took them to the various points of interest in the neighbourhood, and at seven o'clock they were entertained by Prince Galitzin at a sumptuous dinner in the Palace. In the evening a special train brought them back to St. Petersburg, after a day spent among scenes of great interest, and in the enjoyment of truly Imperial hospitality. R. D.

Literary Gossip.

MR. LONGFELLOW has been occupying his leisure for some time back with making a collection of poems illustrative of the chief localities in different countries. The first volume, which will appear shortly, relates to this country, and it will form a poetical guide-book to its places of interest. The poems of several living writers are included in the collection. As a matter of courtesy, their permission has been asked, and, almost as a matter of course, it has been granted in all cases but one, the sole refusal having regard to the poems of Mr. Tennyson. It is impossible to imagine in what way the Poet Laureate or his publishers would be injured had Mr. Longfellow's request been granted. Messrs. Osgood & Co., of Boston, will publish the work.

THE second volume of Mr. Theodore Martin's 'Life of the Prince Consort' is nearly ready, and it will be published early in October.

MR. CHARLES G. LELAND, author of 'Hans Breitmann's Ballads,' 'Pigeon English,' and other works of humour and learning, has in the press an original fairy story, profusely illustrated from his own pen, and called 'Johnnykin and the Goblins.' This volume will be included in Messrs. Macmillan & Co.'s list of Christmas books. The same publishers are about to issue a series of popular books on

"Art at Home." An introductory volume, by Rev. W. J. Loftie, entitled 'A Plea for Art in the Household,' with notes on the economy of judicious collecting, will appear shortly, to be followed soon after by Miss Garrett's practical treatise on 'House Decoration,' mentioned in the *Athenæum* some weeks ago. Both works will be illustrated.

MESSRS. HODDER & STOUGHTON announce a new story by Mr. J. B. de Liefde, entitled 'The Maid of Stralsund: a Story of the Thirty Years' War'; and 'The White Cross and Dove of Pearls,' by the authoress of 'Selina's Story.' The same firm will shortly publish, by arrangement with the author, the narrative of the remarkable events connected with the search for 'Charley Ross,' the kidnapped boy of Philadelphia, as told by his father.

THE *Pall Mall Gazette* charges us with confusing Edib Effendi's report on the Bulgarian horrors with that of the mixed commission of notables. We did nothing of the kind; but we were, we believe, wrong in stating that the report of the latter had been published in England when Mr. Gladstone was writing his pamphlet. It seems to have first appeared in print, as the *Pall Mall Gazette* states, in the *Times* of Sept. 4, although the "Appendix," mentioned by Mr. Gladstone at pp. 35 and 36, had been read by the writer of these lines early in August.

DR. MORITZ TRAUTMANN, of Leipzig, will join the Rev. J. R. Lumby in editing next year for the Early English Text Society the alliterative version of 'The Siege of Jerusalem.' The text will be printed from the Oxford MS. which preserves the alliteration best, and the Cambridge and London MSS. will be collated with it. Copies of all of them have long been in hand. The words and style of the poem prove that it is by an author different from the writers of the other extant Early English alliterative poems.

THE first book printed in English was 'The Recuyell of the Histories of Troye,' which was translated by Caxton in 1471, but was issued without any date of printing. This was followed by 'The Game and Playe of the Chesse,' "Fynysshid the last day of marche the yer of our lord god. a thousand foure honderd and lxxiii." These two books were printed at Bruges, the first book printed in England being, it is believed, the 'Dictes and Sayings of the Philosophres,' bearing date November 18th, 1477, "emprynted by me, William Caxton, at Westmestre." Mr. William Blades has disposed of the popular belief that the art was introduced into England by Caxton in 1474, very satisfactorily:—

"At the end of Caxton's 'Chess-book,'" he says, "is the date of translation, 'Finished the last day of March * * 1474.' According to modern reckoning, this was really 1475, because, as I have shown in my 'Life of Caxton,' II., p. 9, the new year in the Low Countries did not begin then until Easter-day. Now Easter-day in 1474 fell upon April 10, and therefore Caxton did not finish his translation in Bruges till March 31, 1475. As the book was printed after that in Bruges, and before Caxton came to England with the new art, we must, I think, arrive at this conclusion: Caxton probably came to England in 1476, but the first indisputable date we have to stand on is the printing of 'The Dictes,' in 1477."

Adopting, therefore, 1477 as the date of the introduction of printing into England, Mr. J. S. Hodson, of the Printers' Pension Corpo-

ration (which, by the way, will be fifty years old next year), writes to us, suggesting that the quater-centenary of the introduction of printing should be celebrated by an Exhibition of Antiquities and Curiosities connected with the art to be held in some suitable public building, in June next.

THE Bishop of Carlisle writes to us that he is "sorry to spoil a good story," but that no such scene ever took place between him and John Tupling, as was described by the latter to A. J., from whom we lately published a letter.

MR. CHARLES SHAW, the under treasurer of the Middle Temple, has in preparation an 'Inns of Court Calendar: a Record of the Members of the English Bar, Students, Honours, Studentships, and Exhibitions.' It will be published by Messrs. Butterworths.

ANOTHER volume of the new edition of M. de Backer's great work, 'Bibliothèque des Écrivains de la Compagnie de Jésus,' has just been issued, and the "Table des Matières," completing the book, is promised in a few months. The new edition is an immense improvement upon the first, not only from the far more convenient arrangement of the materials, but from the very large additions that have been made, and the fuller and more accurate details supplied. It is a pity that a work of this importance should not have been allowed a wider circulation;—the copies are not in the hands of the booksellers, and are not professedly for sale—only 200 copies have been struck off, and of these very few are likely to find their way into England, unless it be to enrich the libraries of the Jesuit colleges and other favoured institutions. Those who are fortunate enough to possess the first edition need not anticipate any diminution in the market value of their seven octavo volumes. This volume closes with a brief notice of Augustin de Backer, who died suddenly in December, 1873. It is a melancholy reflection that the veteran scholar and "bibliophile" should not have been spared to see the completion of his gigantic undertaking.

MESSRS. HOLT & Co., of New York, who have treated English authors with a liberality which merits praise, are about to issue a series of what they call "Condensed Classics." To give extracts from a classic is nothing new; but to profess to improve a classic by condensation requires some courage. A few years ago an attempt made to render 'Clarissa Harlowe' more acceptable to modern readers by reducing its bulk was not successful. Messrs. Holt & Co. will begin with 'Ivanhoe,' a novel which, whatever its faults, cannot be called tedious. Indeed, a good story is never too long, and Scott's novels are good stories excellently told. It seems rather hard that the writer who rises to the dignity of a classic should be deemed a fitting subject for condensation, a process which cannot be considered complimentary or likely to yield a profitable result.

MR. S. R. VAN CAMPEN is engaged upon a biography of a learned and industrious Dutch historian of the first half of the present century, and at his death a professor at the Amsterdam Athenæum.

MR. GEORGE MACDONALD's new story, 'The Marquis of Lossie,' will first appear in the columns of the *Glasgow Weekly Mail*.

A GERMAN translation of M. Taine's 'Ancien Régime' is announced at Leipzig.

VRAIN-LUCAS, the author of the Pascal forgeries which deceived M. Chasles, has just been condemned to four years' imprisonment, and a fine of 500 francs, for swindling some Paris booksellers.

SCIENCE

BRITISH ASSOCIATION.

MATHEMATICAL AND PHYSICAL SCIENCE.

(SECTION A.)

THE President, Sir W. Thomson, in his opening address, said:—

Six weeks ago, when I landed in England after a most interesting trip to America and back, and became painfully conscious that I must have the honour to address you here to-day, I wished to write an address of which science in America should be the subject. I came home, indeed, vividly impressed with much that I had seen, both in the Great Exhibition of Philadelphia and out of it, showing the truest scientific spirit and devotion, the originality, the inventiveness, the patient, persevering, thoroughness of work, the appreciativeness, and the generous open-mindedness and sympathy from which the great things of science come. I wish I could speak to you of the veteran Henry, generous rival of Faraday in electro-magnetic discovery; of Peirce, the founder of high mathematics in America; of Bache, and of the splendid heritage he has left to America and to the world in the United States Coast Survey; of the great school of astronomers which followed Gould, Newton, Newcomb, Watson, Young, Clarke, Rutherford, Draper, father and son; of Commander Belknap and his great exploration of the Pacific depths by pianoforte wire, with imperfect apparatus supplied from Glasgow, out of which he forced a success in his own way; of Capt. Sigbee, who followed with like fervour and resolution, and made further improvements in the apparatus by which he has done marvels of easy, quick, and sure deep-sea sounding in his little surveying ship *Blake*; and of the admirable official spirit which makes such men and such doings possible in the United States Naval Service. I would like to tell you, too, of my reason for confidently expecting that American hydrography will soon supply the data from tidal observations long ago asked of our Government in vain by a Committee of the British Association, by which the amount of the earth's elastic yielding to the distorting influence of the sun and moon will be measured; and of my strong hope that the Compass Department of the American navy will repay the debt to France, England, and Germany so appreciatively acknowledged in their reprint of the works of Poisson, Airy, Archibald Smith, Evans, and the Liverpool Compass Committee, by giving in return a fresh marine survey of terrestrial magnetism, to supply the navigator with data for correcting his compass without sights of sun or stars. In the United States telegraphic department I saw and heard Elisha Gray's splendidly worked-out electric telephone actually sounding four messages simultaneously on the Morse code, and clearly capable of doing yet four times as many with very moderate improvements of detail; and I saw Edison's automatic telegraph delivering 1,015 words in fifty-seven seconds; this done by the long-neglected electro-chemical method of Bain, long ago condemned in England to the helot work of recording from a relay, and then turned adrift as needlessly delicate for that. In the Canadian department I heard "To be or not to be . . . there's the rub," through an electric wire; but, scorning non-syllables, the electric articulation rose to higher flights, and gave me passages taken at random from the *New York newspapers*:—"S.S. Cox has arrived" (I failed to make out the s.s. Cox); "The City of New York," "Senator Morton," "The Senate has

resolved to print a thousand extra copies," "The Americans in London have resolved to celebrate the coming fourth of July." All this my own ears heard spoken to me with unmistakable distinctness by the thin circular disc armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague-judge, Prof. Watson, at the far end of the line, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform in the neighbourhood of an electro-magnet in circuit with the line motions proportional to the sonoric motions of the air. This, the greatest by far of all the marvels of the electric telegraph, is due to a young countryman of our own, Mr. Graham Bell, of Edinburgh, and Montreal, and Boston, now a naturalized citizen of the United States. Who can but admire the hardihood of invention which devised such very slight means to realize the mathematical conception that, if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and, as nearly as may be, in simple proportion to the velocity of a particle of air engaged in constituting the sound? The Patent Museum of Washington, an institution of which the nation is justly proud, and the beneficent working of the United States patent laws, deserve notice in the Section of the British Association concerned with branches of science to which nine-tenths of all the useful patents of the world owe their foundations. I was much struck with the prevalence of patented inventions in the Exhibition; it seemed to me that every good thing deserving a patent was patented. I asked one inventor of a very good invention,—"Why don't you patent it in England?" He answered,—"The conditions in England are too onerous." We certainly are far behind America's wisdom in this respect. If Europe does not amend its patent laws (England in the opposite direction to that proposed in the Bills before the last two sessions of Parliament), America will speedily become the nursery of useful inventions for the world. I should tell you also of "Old Prob's" weather warnings, which cost the nation 250,000 dollars a year. Money well spent, say the western farmers, and not they alone. In this the whole people of the United States are agreed, and though Democrats or Republicans, playing the "economical ticket," may for half a session stop the appropriations for even the United States Coast Survey, no one would for a moment think of starving "Old Prob"; and now that eighty per cent. of his probabilities have proved true, and General Myers has for a month back ceased to call his daily forecasts "probabilities," and has begun to call them indications, what will the western farmers call him this time next year? But the stimulus of intercourse with American scientific men left no place in my mind for framing or attempting to frame a report on American science. Disturbed by Newcomb's suspicions of the earth's irregularities as a timekeeper, I could think of nothing but precession and nutation, and tides and monsoons, and settlements of the equatorial regions and melting of polar ice. Week after week passed before I could put down two words which I would read to you here to-day, and so I have nothing to offer for my address but a review of evidence regarding the physical conditions of the earth; its internal temperature; the fluidity or solidity of its interior substance; the rigidity, elasticity, plasticity of its external figure; and the permanence or variability of its period and axis of rotation.

As a result of this review, he found that certain reasonings which he had published regarding precession and nutation in a rigid shell filled with liquid were wrong. He had now worked out the problem rigorously, for the case of a homogeneous liquid enclosed in an ellipsoidal shell; and had obtained results, which were absolutely decisive against the geological hypothesis of a thin rigid

shell, full of liquid. But, interesting in a dynamical point of view, as this problem of Hopkins's is, it cannot afford a decisive argument against the earth's interior liquidity. It assumes the crust to be perfectly stiff and unyielding in its figure, and this of course it cannot be, because no material is infinitely rigid. But may it not be stiff enough to practically fulfil the condition of unyieldingness. No, decidedly it cannot. On the contrary, were it of continuous steel and 500 kilometres thick, it would yield very nearly as much as a solid globe of indian-rubber, to the deforming influences of centrifugal force and of the sun's and moon's attractions. The supposition of a crust of such thickness as would be consistent with the actual amounts of precession and nutation, with a liquid interior, is disproved by observations of the tides, which show that there is no such flexibility in the shell as this supposition would require. The investigations of Adams and Dalaunay had shown that there was an apparent acceleration of the moon's mean motion, possibly due to a real retardation of the earth's rotation by tidal friction. Newcomb's subsequent investigations in the lunar theory have, on the whole, tended to confirm this result; but they have also brought to light some remarkable apparent irregularities in the moon's motion, which he believes to be really due to irregularities in the earth's rotational velocity. If this is the true explanation, it seems that the earth was going slow from 1860 to 1862, so much as to have got behind by seven seconds in these twelve years, and then to have begun going faster again, so as to gain eight seconds from 1862 to 1872. So great an irregularity as this would require somewhat greater changes of sea-level, but not very much greater, than the British Association Committee's reductions of tidal observations for several places in different parts of the world allow us to admit to have possibly taken place.

A vote of thanks for the address was moved by the President of the Association, and seconded by the Duke of Argyll, who expressed his satisfaction that Sir W. Thomson had checked the undue boldness of geologists.

The first paper was the Report of the Committee appointed for the verification of Ohm's Law. It described experiments conducted under the direction of Prof. Clerk Maxwell, in the Cavendish laboratory by Mr. Chrystal, Smith's prizeman of 1875, and is deemed so important that a full account of the experiments will be printed in the volume of *Proceedings*. This is the first attempt that has ever been made to determine whether the law is rigorously exact; and the result is that it cannot have any error so great as one part in a billion.

Prof. James Thomson then exhibited a model designed to illustrate the fact that rivers flowing through alluvial plains tend to increase their sinuosities. The model consisted of a winding channel of clay through which a stream of water flowed; and had threads moored at various points by means of pins. Those which were so moored as to float on the surface, set themselves parallel to the banks; but those which were attached to a lower point of the pins, so as to lie at the bottom, were observed to set themselves obliquely, the free end being nearer to the inner bank. There is in fact, an under-current from the outer to the inner bank, in a thin layer of water at the bottom, caused by the greater elevation of the surface at the outer bank by centrifugal force. This under-current carries away mud from the outer and deposits it on the inner bank, thus increasing the bend of the river.

CHEMISTRY. (SECTION B.)

MR. W. H. PERKIN, this year's President of the Chemical Section, gave in his introductory address an exposition of the scientific researches which have led up to, and culminated in, the development of two of the most important branches of the dye-industry. No more appropriate subject could have been chosen for the purpose of demonstrating to

"practical men" the value of purely theoretical speculations.

Twenty years ago the manufacture of the aniline colours was commenced by the discovery of the "mauve purple." To what source is this discovery traceable? It was in 1825 that Faraday published in the 'Philosophical Transactions' his research on the oily products separated in compressing oil-gas, and described a substance he obtained from it—a volatile colourless oil, which he called bicarburetted hydrogen. Mitscherlich, some years afterwards, obtained the same substance from benzoic acid, and gave it the name it bears, viz., "benzol." This same chemist further obtained from benzol nitrobenzol, by acting upon it with nitric acid. Zinin afterwards studied the action of reducing agents upon nitrobenzol, and obtained "aniline," which he at that time called benzidam. Again, Pelletier and Walter discovered the hydrocarbon toluol in 1837. Deville produced its nitro-compound in 1841; and Hofmann and Muspratt obtained from this "toluidine," by the process used by Zinin to reduce nitrobenzol. None of these investigations was made with a hope of gain. But to go on. Doebereiner, a long while ago, obtained from alcohol a substance which he called "light oxygen ether," now known as aldehyd. Gay-Lussac produced iodide of ethyl in 1815. Dumas and Peligot discovered the corresponding substance, iodide of methyl, in 1835; but, as in the cases previously referred to, these bodies had no practical value, until Hofmann, in his researches on the molecular constitution of the volatile organic bases, discovered in 1850 the substitution compounds of aniline containing alcohol radicals.

Of yet greater interest, perhaps, is the derivation of alizarin from anthracene, a splendid coal-tar product. Alizarin, which is the principal dyeing agent in the madder-root, was for a long time supposed to be related to naphthalene, inasmuch as phthalic acid can be produced from both of them. It was not until 1868 that this was proved to be a mistake, and the relationship of alizarin to anthracene was discovered by Graebe and Liebermann, who succeeded in preparing this coal-tar product from the natural alizarin itself. Having obtained this important result, they turned their attention further to the subject, hoping to find some process by which alizarin could be produced from anthracene; in this they were soon successful.

With reference to the origin of the products which are used for the manufacture of artificial alizarin, the first researches made in reference to anthracene were by Dumas and Laurent in 1832; subsequently Laurent further worked upon this subject, and obtained, by the oxidation of this hydrocarbon, a substance which he called anthracene; he also obtained dichloranthracene. Dr. Anderson also made an investigation on anthracene and its compounds in 1863, and assigned to it its correct formula; he re-examined its oxidation-product, which Laurent called anthracene, and named it oxyanthracene, the substance we now know as anthraquinone. But to bring out more clearly the practical importance of these fruits of scientific research, it will be well perhaps to see what has been their influence on the colouring-matters which were in use before them, and also the extent of their present consumption. The influence of the so-called aniline colours on dye-woods, &c., has been remarkably small. It is true that at first magenta had a depreciating influence upon cochineal; but this has passed away, and now the consumption of that dye is as great as ever. This want of influence is not so very remarkable, considering that aniline colours are entirely new products, differing in composition and properties from the old colouring-matters, and therefore could only displace them to a certain extent. But whilst this is the case, the aniline colours have been more and more used, until at present it is computed that their annual sale in the United Kingdom and on the Continent exceeds 2,000,000*l*. This is probably due to new applications and increase of trade. When, however, we come to consider the influence of the anthracene

colours there is a very different tale to tell. Here we have a competition not between two colouring-matters, but the same from different sources—the old sources being the madder-root, the new one coal-tar. The average value of the annually imported natural alizarin between 1859 and 1868 was, in round numbers, 1,000,000*l*; that of the present year, calculated from previous data, will be about 140,000*l*. These figures speak for themselves. It is expected that madder-growing will soon be a thing of the past, thousands of acres of land being at the same time liberated for the growth of those products we cannot produce artificially, and without which we cannot exist. From the brief history given, we see that the origin of these colouring-matters is entirely the fruit of many researches made quite independently by different chemists, who worked at them without any knowledge of their future importance; and on looking at the researches which have thus culminated in this industry, it is interesting to notice that many, if not most of them, were conducted for the purpose of elucidating some theoretical point.

The first paper read was by M. M. P. Muir, 'On Essential Oil of Sage.' He explained the various experiments he had made and the products he had found therein. The oil was of a yellow-brown colour, without any shade of green, having a strong sage odour, and a hot, burning taste. Its reaction was neutral; it rapidly absorbed oxygen from air, and is acted upon by strong nitric and sulphuric acids. Its specific gravity was 0.9339 at 14°, and after prolonged fractionation the oil splits into four portions—two liquids, almost certainly terpenes, boiling at 157° and 167°; a liquid, containing probably oxygen, boiling at 198° to 203°; and a solid camphor, melting at 187°.

Mr. J. A. R. Newlands read the next paper, 'On Relations among the Atomic Weights of the Elements when arranged in their Natural Order.' This was, he said, a fascinating subject to chemists. If people wished to have an ideal unit, they must push it away beyond practical experiment; and having explained Strauss's, Dumas's, and other theories, he produced a table of grouped elements, and adduced some interesting facts, which when first he introduced them were, he said, looked upon as most ridiculous. The elements he treated of were of great importance, from their being widely diffused in the earth, the ocean, or the atmosphere, forming a large portion of the earth's crust, and being essential to animal and vegetable life. Omitting fluorine, the list comprised two representatives of each of the seven principal groups of elements, thus:—Monads, sodium and potassium; dyads, magnesium and calcium; triads, aluminium and iron; tetrads, carbon and silicon; triads or pentads, nitrogen and phosphorus; dyads or hexads, oxygen and sulphur; monads or heptads, hydrogen and chlorine. These relations were shown by means of the tables, the different columns being given as follows:—1st, the ordinal number; 2nd, the symbol; 3rd, the atomic weight; and 4th, the difference between each atomic weight and that preceding it. One remarkable circumstance was the fact of a simple relation existing between all the known elements when arranged in the natural order of their atomic weights, a fact which might be stated most simply thus:— "Elements belonging to the same group stand to each other in a relation similar to that between the extremes of one or more octaves in music." Thus, if one commenced counting at lithium, calling it 1, sodium would be eight and potassium 15, and so on. This relationship was made obvious by adopting a horizontal arrangement. Taking sodium as 10, the difference between the atomic weights was almost identical with the difference between ordinal numbers.

Mr. J. J. Coleman read a paper 'On a Gas Condensing Machine for the Liquefaction of Gases by combined Cold and Pressure.' Having pointed out the progress of the subject, he produced an experimental apparatus which he had constructed, and explained the mode by which he obtained the object in view—to expose to pressure and intense

cold the waste gas—the results of which were given in a paper read to the Chemical Society about a year ago. The paper described a method of carrying out Faraday's principle of the liquefaction of gases by combined cold and pressure on the large scale, by means of a machine in which the expansion of the gas in the act of doing work produced the cold to be used in addition to pressure, and neatly illustrated this by reference to the large machine (designed by himself) erected by Young's Paraffin Light Company for producing volatile naphtha from their waste gases.

Mr. W. Ramsay made a communication 'On Picoline and its Derivatives.' Picoline was discovered by Anderson, who first obtained it from bone oil and afterwards from coal tar. The yield from the latter was more satisfactory than the former. He went on to describe the salts of picoline, and said it probably does not contain a methyl group, for on oxidation it yields Dewar's pyridene di-carbonic acid. This acid is not derived from lutidine, as was supposed by Wright. Experiments to prepare the aldehyde and alcohol from di-carbo pyridenic acid lead to a prospect of success, and from the alcohol true methyl-pyridine may possibly be obtained.

Mr. J. E. Stoddart read a paper 'On Lead Desilverizing by the Zinc Process.' Having described the different processes that had existed for treating the alloy, he stated that the process now in use and carried on at Messrs. Lang's Clyde Lead Works was that of M. Manes, of Messrs. Guillem & Co., Marseilles, who was the first to work Flach's process, and who found out and patented a simple means of treating the alloy and recovering the zinc by distillation. The process is known as the Flach-Guillem. By the process the lead can be desilverized, and turned out in the shape of market lead, in thirty hours from the time it is put in process, the loss in working being not more than 1½ per cent. That all the silver is thoroughly taken out may be seen from the fact that there is an excess of silver obtained on the large scale to the extent of nearly two per cent. over the assays. An analysis of the market lead gave antimony '0015 and silver '0004 per cent., a trace of copper, but no iron or zinc; from which it would be seen that the lead refined by the zinc process is almost chemically pure, and to this is due the finer quality of the products manufactured from it.

Friday, the 8th, was chiefly devoted to the important question of Sewage Utilization.

Prof. Corfield read the Report of the Sewage Committee, which consisted in the description of the work of the Committee during the past year at Breton's Farm, near Romford. During the months of June, July, August, and September, little or no nitrogen, as nitrates or nitrites, was found in the effluent water, and from this it might hastily be concluded that for some reason or another the usual amount of oxidation had not gone on the soil; but the fact turns out to be that oxalic acid had been added to the samples (both sewage and effluent water) of these months, with the view of preventing oxidation going on in them during and after collection. The true average amount of nitrogen in the sewage was 553 parts per 100,000, and the amount of nitrogen calculated to be applied to the farm in the sewage was 30,252 tons. Of this quantity, 01406 ton was collected in the effluent water pumped over the farm. It was remarkable how little the true average composition of the sewage differed from the results obtained in previous years, and the Committee considered that this circumstance afforded considerable proof of the accuracy of their methods of sampling, the principle of which had always been that the samples should be taken in proportion to the amount of flow at the time; thus the amount of nitrogen in parts per 100,000 in the sewage had been, according to the calculations from the results of the gauging and analyses, as follows:—1871-72, 5529; 1872-73, 5151; 1873-74, not taken; 1874-75, 556; 1875-76, 553. The rainfall in 1872-3 was excessive, which accounted for the

small proportion of nitrogen, and with regard to 1874-5 the number given was the result of a single analysis of all the monthly samples taken in quantities proportionate to the amounts of sewage distributed each month. Experiments made with bottled sewage and effluent water (kept for some time) showed that the total amount of nitrogen in the solid matter was not altered by keeping. The nitrogen in the effluent water was almost all converted into nitrates. This applied to filled bottles. In the case of unfilled bottles, a large quantity of the nitrogen in the sewage was lost, while in the effluent water it was only slightly diminished in amount, but was almost all oxidized to the condition of nitrates. Regarding the produce of the farm, the Report stated that three plots of Italian rye-grass yielded respectively 58, 53, and 48 tons per acre. The highest average of mangold crops had been nearly 47 tons per acre. The nitrogen recovered in the crops was 20,558 lb., equivalent to 30·34 per cent. of that received in the sewage. Dr. Corfield concluded by stating that the lease of the farm being now up, and as another field of operations had not yet been obtained, the Committee did not in the mean time ask to be re-appointed.

Mr. J. J. Coleman next read a paper 'On Experimental Researches on the Chemical Treatment of Town Excreta, with special reference to that of Glasgow.' The methods in use of dealing with town sewage, the author stated, resolved themselves into (1) treatment with lime; (2) treatment with metallic oxides or salts; and (3) treatment with carbon. He approved of the last-named method, for whilst carbon possessed the powers of abstracting noxious matter from the sewage in at least as great a ratio as any chemical that could be used, the carbonaceous deposits it formed were not liable to subsequent noxious putrefaction, and the manual value of the mud was not interfered with. The expense of charcoal for the treatment of sewage was a very serious question, but his attention had been called to a waste product produced largely in this district, namely, the residue removed from the retorts in distilling shale oil, some 500,000 to 600,000 tons of which were produced annually. The quantity of fixed carbon this material contained ranged about 10 per cent., and its state of division was, no doubt, similar to that contained in bone black. Mr. Coleman went on to say that he had made a number of experiments as to its power of deodorizing, all of which were eminently satisfactory. He had also compared it with the action of bone and wood charcoal, the general result being that, whether animal charcoal or carbonized shale were used, the proportion of one part of carbon to two of excrementitious matter was insufficient to prevent a slight putrefactive decomposition after the lapse of two or three weeks, the temperature of the mass being maintained at about 60° F.; but that equal parts of excrementitious matter and carbon formed a permanently odourless mass, whether animal charcoal or carbonized oil shale were used. Mr. Coleman pointed out that Sir John Hawkshaw's estimate of the sewage manure which would be produced by treating Glasgow sewage with a chemical process would be probably 500,000 tons annually, and that Sir John thought it would be difficult to dispose of. Further, according to the Rivers Pollution Commissioners' analysis of Glasgow sewage, and also experiments of the able chemists Hoffman, Way, and others, sewage contains on an average no more than 100 grains total solids (soluble and otherwise) per gallon; and that on this basis the annual production of sewage manure in Glasgow would not be more than 200,000 tons per annum, which agrees with the Crossness experiments of the Metropolitan Board of Works. He also pointed out that at the present moment the City of Glasgow Cleansing Department sell annually to the farmers 200,000 tons per year, at 2s. 6d. to 2s. per ton, and that the same quantity sold at 5s. per ton would clear expenses, and dispose of all Glasgow sewage mud.

Another treatment of the sewage is recommended by Mr. J. Banks, and consists in filtration com-

bined with aeration. The medium used for the first is charcoal, either of wood or peat, which, being of an extremely porous nature, presents through its mass a greater amount of surface than any other known substance, thus giving it an absorbent power that might appear almost fabulous. Assuming that in all sewerage works the main outlet will debouch into a series of settling-tanks, his treatment commenced from that point, and, having at length explained the system, he said it was applicable to small places as well as to cities numbering their denizens by hundreds of thousands. The application of manure in a liquid state was rarely, if ever, satisfactory; but when, as on sewage farms, it was constantly flowing day and night, the effect was that the soil gets saturated, and sours, while the plants, having a greater quantity of food forced on them than they can assimilate, get weak at the roots, and coarser in the fibre year by year. On the other hand, manure such as is proposed to be made under this system, applied to the land in a dry and friable state, is taken up by the plants in such quantities and at such times as their growth requires. The system had been in operation for months at Prescot, near Liverpool, where the Social Science Congress will next month take the opportunity of satisfying themselves of the practicability of the scheme.

The preceding two papers and the Report gave rise to a very animated discussion. Mr. Stanford said the charcoal process had this defect, that it did not retain all the impurity, and there was this objection to the weak charcoal which had been spoken of, that, supposing they took it as containing 10 per cent. of carbon, they were introducing into the purifying process a substance 90 per cent. of which was absolutely valueless. With regard to the Report of the Sewage Committee, he was sorry that it had developed very much into a mere Report on irrigation. The Committee had done valuable work, no doubt, but they had not treated this subject of sewage in the broad way to which it was entitled, and the result was that no question had been thoroughly sifted, save that of Mr. Hope's farm. Even in connexion with that the Committee had left out what sewage-reformers wanted most to know, namely, the balance-sheet.—Dr. Gilbert said he thought it would be found that in the earlier years of the Committee's work they had investigated other processes besides that of irrigation, and had reported upon them, though, for substantial reasons, investigation was not followed up. One of those reasons was the want of money. With regard to sewage irrigation, he was quite ready to admit that there were difficulties connected with it, but, for all that, it was the most effective system before the public. If interception only gave one-fourth of the nitrogen, they must look to irrigation for a less wasteful process, and he was in hopes that, if town councils did not of their own accord take up the process, they would be driven by the Court of Chancery to adopt it. Mr. Stanford had lamented the absence of a balance-sheet in connexion with the Report on Mr. Hope's farm. In reply to that, he was quite free to admit that there had been a loss on the working, but his clear opinion was that, loss or not, the country ought to resort to irrigation. Beyond all doubt it was the least costly system, and when it came into general use and created its own markets, there would be very little, if any, excess of expenditure over revenue. Beyond and above that question it restored the sewage to the soil, and, instead of poisoning our streams, added, in no small measure, to our means of cultivating the materials of human subsistence. Dr. Gilbert further said that a mixed system of irrigation and filtration would be the best for a large town like Glasgow.—Dr. Fergus said it seemed to him that in the consideration of this question chemists and chemistry had not got fair play. The science of chemistry had never been properly brought to bear upon it. People seemed to forget or to ignore that there was such a thing as a law of nature whereby everything which came from the earth must return there again, and their forgetting or ignoring that fact, as a matter of course entailed its own punish-

ment. They poisoned their rivers with sewage, having adopted the great cardinal error that water was a purifier, whereas it was nothing of the kind. Water was not a purifier but a carrier, and what purification went on in it was due, not to the water itself, but to the atmospheric air which it contained. The ventilation of sewers was a subject much talked of at present, but even here we proceeded upon error, for we sought to get rid of the foul air without making any provision for the ingress of fresh air, and the result was that the one got out, but the other never got in. The diseases arising out of this state of things were constantly on the increase. Typhoid fever, which was a direct result of excremental pollution, was a notable illustration of the fact, for although we had in Glasgow a plentiful supply of pure water, independent of wells, we had still amongst us a malady which was associated with impure water in other places. Had as much, or half as much, attention been given to the subject of sewer gases as had been bestowed on other branches of this great question, they might by this time have solved the difficulty which attached to it.

It becomes evident, from the tenor of the discussion, and, indeed, from Dr. Gilbert's admissions, that no case had been made out for the system of irrigation by its advocates.

A paper, by Prof. Gamgee, 'On the Physiological Action of Pyro-, Meta-, and Ortho-Phosphoric Acids,' and the Report on 'Commercial Analysis of Phosphates and Potash Salts,' by Mr. Allen, brought the proceedings of the day to a close.

GEOLOGY. (SECTION C.)

DURING the last four or five years, it has been the custom for the President of this Section to take, as the subject of his address, the geological structure of the district in which the Association assembled. There are some advantages in this plan; it places clearly before the mind of strangers many points which cannot fail to interest them, and it serves as a good introduction to the papers on local geology which never fail to appear. This year, however, Dr. Young has printed in the 'Catalogue of Fossils,' &c., published by the local committee, an excellent introduction to the geology of the district; he was, therefore, left free to choose for his address a subject of more general and lasting interest.

The Glasgow meeting of 1876 will, perhaps, be somewhat memorable in the history of British geology. While Sir W. Thomson, in Section G, was showing the necessity for a revision of prevailing notions on that subject, Prof. Young, in Section C, was showing geologists how far such revision could fairly be made. The old school of geologists got over difficulties by invoking the aid of agents either vastly greater in power, or wholly different in kind, from any of which we now have any knowledge. In the modern reaction against this school, geologists have attempted to solve the problems presented to them by assuming unlimited time. So long as there were geologists of eminence who firmly maintained the former views, it was not greatly to be wondered at that theirs should push to an undue length their opinion as to the latter view.

But now a more healthy state of opinion seems to be gaining ground. Geologists are willing, nay, are anxious, to receive such help as the physicists can give them in solving the great problems which geology presents; and, if the theories of physicists can be shown to rest on good grounds, and to be in accordance with each other, there need be no fear that geologists will blindly oppose them. But so long as physicists are at variance with each other on the question of the age of the habitable earth,—Sir W. Thomson allowing one hundred millions of years, Prof. Tait only ten to fifteen millions,—geologists must be content to wait.

Part of Prof. Young's address was devoted to an examination of the evidence upon which geologists have founded their belief in the thickness of the sedimentary rocks. If sediment can be shown to be deposited at a certain average rate, and if the

rocks are of a certain thickness, it would seem that some estimate might, perhaps, be made as to the time requisite for the formation of these rocks. Such, at least, has been the process of reasoning often adopted. But Prof. Young pointed out that any argument founded upon a calculation of the greatest known thicknesses of formations must be misleading, because these formations are not all equally developed in any one district; and even where formations are largely developed in any one district, it is necessary sometimes to range them in parallel lines, and not in one continuous vertical column. Freshwater strata of one place are the equivalents in time of marine strata elsewhere. These considerations might lead us to lessen the geological column, and, therefore, to curtail the time. But what of the missing strata, those which have been deposited and have since been denuded? Prof. Young endeavoured to show that the gaps in time thus unrepresented are less than is generally supposed; and he believes that the quantity of strata so withdrawn cannot be proved to represent more than a small fraction of the whole. "To provide the needed elongation of geological time by an appeal to arbitrary speculations is not admissible. Belief on belief is, as Butler says, bad heraldry. The denudation, to which importance is justly ascribed, is that represented by an unconformity. Re-elevation has been accompanied by disturbance of the area from a different centre than that around which subsidence took place. The strata are worn obliquely; and thus thickness of the mass at one place is greatly diminished, though it does not follow in all cases that the maximum thickness of the strata has been affected. The importance, as I deem it the excessive importance, which is attached to the missing strata, is a favourite doctrine with biologists, who apparently unconsciously seek to gain, by prolonging the interval between successive groups, the time which ought rather to be sought for in tracing, were that possible, the migrations of the species which seem to have suddenly died out."

Prof. Young set himself a task of no small difficulty when he strove "to show that even the limitation of time which Prof. Tait prescribes for us may not, after all, be too narrow for the processes which have resulted in our known stratigraphy." The earliest known fossiliferous formation is the Laurentian, and this contains fragments of antecedent rock. Possibly the last named may not have been fossiliferous; but, whether it was so or not, we have at present no means of knowing. We are inclined to think it is scarcely wise to found any argument upon negative evidence of this kind. It is not many years since the rocks known as Laurentian were classed as Azoic; but the discovery of Eozoon added 30,000 feet to the column of fossiliferous strata. It is true that the fossils yet discovered are few; but we must bear in mind the great amount of change and metamorphism which these old rocks have undergone.

The burden of proof necessarily lies on those who believe that long before Laurentian times, sedimentary rocks were deposited in seas inhabited by animals and plants. In the present state of the science, then, Prof. Young is entitled to believe that "the earliest stratified deposits known are the Laurentian; and they are, so far as we know, the earliest to have been deposited."

Prof. Young was perhaps in complete accord with his audience when he asked that greater precision should be employed in the use of geological terms; that "the continued acceptance of loose phraseology is peculiar to geology." The general drift of this thoughtful and well-reasoned address was tersely summed up in the concluding words: "So far as our present knowledge goes, we must accept it as certain that there is some limit to the duration of the earth in the past. Neither philosophers nor astronomers are agreed on the essential points of the problem; nor have they considered all the possible changes in the position of the earth's axis, and in the rate at which the earth loses heat. The limits hitherto prescribed are so discrepant that we cannot as yet accept

any as fixed. Neither have geologists so accurate a knowledge of geological processes that they can speak with confidence either of the absolute or relative rates at which rock-formation has advanced. The geologist has hitherto asked for more time, not because he himself was aware of his need, but from a generous regard for the difficulties in which his zoological brother found himself when he attempted to explain the diversity of the animal series as the result of slowly operating causes. The geologist asked for more time simply because he could form no just estimate of what was needed for the physical processes with whose results he was familiar. But paleontological domination is now at an end; and the increasing number of geologists who are also competent physicists and mathematicians appears to mark a new school, which will strive to interpret more precisely the accumulated facts. Such, at least, seems the history of the last fifteen or twenty years—such seems the direction in which speculation now tends; and in the foregoing remarks I have endeavoured faithfully to represent the drift of our science."

ANATOMY AND PHYSIOLOGY. (SECTION D.)

THIS department was presided over by Dr. M'Kendrick, Vice-President of the Section. His address will be noticed in our next issue. An unusual number of interesting communications in anatomy, physiology, histology, and embryology have been made to this department. A considerable series of excellent researches came from the Owens College Laboratory, and were brought forward by Prof. Gamgee, Mr. Leopold Larmuth, and Dr. John Priestley. They related to various poisonous and other effects produced by vanadium, chromium, and the different forms of phosphoric acid. It appears that vanadium is an intense irritant poison, rapidly causing death, preceded by paralysis, convulsions, and drowsiness. When much diluted, the solutions of its compounds act injuriously on very simple organisms, as bacteria and fungi. Vanadium is not a muscular poison in general; when injected into the muscles it does not appear to cause any diminution in their power of doing work; but yet it acts as a poison of the muscular substance of the frog's heart. Again, whilst the inhibitory centres of the auricles are not affected, the administration of vanadium causes the vagus nerve to lose its power of inhibiting the contraction of the ventricle.

The researches on the action of chromium have borne out the judgment of chemists that chromium is unlike vanadium. Chromium, in the first place, produces irritation of the gastric mucous membrane, and, secondly, acts directly on the great nervous centres, causing convulsions, paralysis, vomiting, a fall of blood pressure, and a sudden and temporary stoppage of the heart in dilatation. It is not specially a poison of muscle or nerve trunks.

Connected with these researches are those on the forms of phosphoric acid, for a relation of correspondence is found to exist in the effects of all the phosphates and the analogous vanadates. Although all are more or less poisonous, there are gradations in the intensity of these effects; the metaphosphoric acid is not so poisonous as the pyrophosphoric. Not only does the pyrophosphoric acid produce death very rapidly, but it may also be made to produce the same result very slowly; it is especially a cardiac poison.

Dr. William Stirling, of Edinburgh, brought forward his discoveries regarding the nervous apparatus of the lungs. He has followed up the finding of small nervous ganglia near the peripheral distribution of very many nerves in the various organs of the body, by discovering them also in the tissues of the lungs. These ganglia appear to be principally related to the sympathetic nerve fibres, and are most numerous around the branchings of the air-tubes at the base of each lung. The fibres with which these ganglia are connected probably act upon the muscular fibres of the blood-vessels, and so regulate the amount of blood passing

through them. Dr. Gardner suggested that they might have something to do with regulating the calibre of the air-tubes, and, consequently, the amount of air supplied to each particular portion of lung. He had often had reason to believe that there was some such special arrangement for the phenomena presented by both healthy and diseased persons.

Mr. R. Garner's paper, 'On the Size of the Brain in the Dog,' brought out some facts of interest. He has found, from measurements of brain capacity and from casts of the interior of skulls, that the size of the brain in dogs does not correspond very closely with the size of the animal. No dog has so large a brain as the wolf, nor one so small as the jackal. The brain of a Newfoundland dog is very little larger than that of a terrier. Prof. Macalister, of Dublin, gave an account of the brain of Master Magrath, the celebrated greyhound. He had weighed the brain of many others, but Master Magrath's was the heaviest of all, and the convolutions were much more complex. He has found that the brains of dogs vary in the complexity of their convolutions as much as those of human beings.

Prof. Turner, of Edinburgh, gave a lucid account of the various forms of structure found in the placenta of mammals, or the special developments of the womb and the fetal membranes by which the embryo is nourished and its waste products removed. These forms have long been supposed to be sharply divided one from another, and to be incapable of gradational connexion. But Prof. Turner, after a long series of laborious investigations, finds that transitions may be traced throughout the forms he has examined, and that there is no necessity for supposing, as some have done, that the modifications of the placenta present an absolute bar to the possibility of evolutionary relationships between the different families. The modifications also appear to be connected with many advantages to the higher groups.

Mr. F. M. Balfour, Fellow of Trinity College, Cambridge, gave a blackboard demonstration of some of the most important results which he has attained in studying the development of the dog-fishes in the egg. These it would be very difficult to make plain without the aid of figures; but it may be stated generally that they throw great light not only on the essential structure of vertebrate animals, but also on the relationship between vertebrates and invertebrates. Dr. Allen Thomson and others of high repute joined in commending Mr. Balfour's investigations. Dr. Thomson particularly took occasion to say that it was quite a new thing for England to be the seat of the production of such a continuous series of accurate and valuable embryological observations as those which Mr. Balfour was making.

ANTHROPOLOGY. (SECTION D.)

MR. ALFRED R. WALLACE, the President, read an address, and a brief account may be given of the concluding portion, which had special reference to Anthropology.

In sketching the beginning and progress of the modern doctrine of the antiquity and origin of man, he particularly wished, he said, to attract more attention to certain points of difficulty.

He related the instances in which the discovery of weapons and relics had been neglected and resisted, until, in 1859, the existence of flint implements in the gravels of the North of France, which had been made public fourteen years before, was authenticated and established. At the same time the caverns of Devonshire were examined, and were found equally to bear out the statements published eighteen years before. Now the belief in man's vast and still unknown antiquity is universal among men of science and hardly disputed by any well-informed theologian; so that the present generation of science students must be somewhat puzzled to understand what there was in the earliest discoveries that should have aroused such general opposition and been met with such universal incredulity.

The question of the mere antiquity of man sank into insignificance at a very early period, in comparison with the far more important and more exciting problem of the development of man from some lower animal form. The controversy about the fact of such development is now almost at an end, since Prof. Mivart, one of the most able representatives of Catholic theology, fully adopts it as regards physical structure. He reserves his opposition for those parts of the theory which would deduce man's whole intellectual and moral nature from the same source and by a similar mode of development. There has never perhaps, in the whole history of science or philosophy, been so great a revolution in thought and opinion effected as in the twelve years from 1859 to 1871, the dates of Mr. Darwin's 'Origin of Species' and 'Descent of Man.' Thus the belief in the independent creation or origin of the species of animals and plants, and even the belief in the independent origin of man, have utterly disappeared among the literary and educated classes generally.

It is a curious circumstance that no advance whatever has been made for a considerable number of years in detecting the time and the mode of man's origin, though negative evidence in geology is of slender value. Many converging lines of evidence show that in the theory of development man must necessarily be immensely older than any traces of him yet discovered:—1, The bulk and development of the brain of man, the oldest known crania of the Engis and Cro-Magnon caves showing no signs of degradation; 2, The nature of many of the works of art found even in the oldest cave-dwellings; 3, Prof. Mivart's demonstration that man is related, not to any one, but almost equally to many of the existing apes in a variety of ways, while so far back as the miocene deposits we find the remains of apes allied to these various forms, so that in all probability the special line of variation leading up to man branched off still earlier.

Mr. Wallace, in his remarks on the antiquity of culture among men, proceeded to examine the remains in Easter Island, North, Central, and South America, enlarging on the works of the mound-builders. The relations of the Great Pyramid were to him a strong argument of the advanced state of culture preceding that Egyptian work. This culture, that of Confucius and Zoroaster, of the Vedas and of the ancient Greeks, had, he considered, never been surpassed. There must have been from an early time the like alternations of civilization and barbarism, occurring in a general course of progress.

The address of Mr. Wallace drew forth a short address from Dr. Hooker, who, in proposing a vote of thanks, detailed the history of the joint researches of Messrs. Wallace and Darwin, and of their self-denial in claiming merit, and their mutual generosity in attributing it to each other.

The Report of the Anthropometric Committee was supported by the detailed observations of Col. Lane Fox, F.R.S., and the exhibition of some standard results, with proposals for improvement in the measuring and testing of recruits. Mr. W. Chappell, F.S.A., proposed an amendment in the acoustic test.

The paper of Mr. James Shaw, 'On Right-handedness,' was short, but gave many facts in illustration of the phenomena, in addition to those of himself and other observers. He referred to the use of the right tusk by the elephant, communicated by Sir S. Baker.

His next paper, 'On the Mental Progress of Animals during the Human Period,' was marked by the same characteristics. It referred to the influence of man in modifying the habits of wild animals by the chase, and the alteration of their food, showing, as by comparison with secluded places like Kerguelen's Land, how great is the contrast between animals in contact with man or unacquainted with him.

Mr. Hyde Clarke read a paper, which was an expansion of his communication to the *Athenæum*, and in illustration of remarks of the President, and in it he gave examples of the common

application in the pre-historic epoch of the same words for Man, Monkey, Lizard, &c.

The paper of Herr Humboldt von der Horck, 'On the Laplanders,' gave not only an amusing account, but, as Dr. Beddoe pointed out, offered many new facts and corrections of statements of other travellers. Dr. Beddoe stated that among the South Welsh are to be found eyes which, to his mind, present elements of the Lapp type. It was agreed that the affinity of the Lapp language to the Ugrian is no proof of affinity of blood, but a result of conquest, and the more particularly as in that group of the Ugrian languages situated in the Himalayas, the Lapp elements are found amongst the lowest tribes, and the Magyar amongst the higher.

This may be the place to mention that both this Section and Section F. were much interested in promoting a grant for typical photographs of races of the British Isles, a proposition afterwards extended to the British Empire.

In conformity with custom, one day was made a local or Scotch day; but the papers were few, and the usual crowd thinned down, and the attendance became meagre. The interest shown by Glasgow people in Gaelic was small, though the amateurs warmed up the day after the fair, when Celtic scholars presented themselves and their papers, but some good was done. Mr. Hector M'Lean's paper, 'On the Highland Language and People,' was read, and it brought out many good observations. The Rev. Mr. Cameron and the Rev. Mr. Ross also illustrated the non-Aryan affinities of Gaelic, the latter from Maori. In discussion it was explained that these affinities, while true, were derived from the same pre-historic stock, and that it was desirable to continue the investigations for ascertaining how far the Celtic branch of Aryan presented evidences of independent development or the influence of special associations. Mr. M'Lean also contributed some curious observations on anglicizing and gaelicizing surnames.

A paper, by Dr. Phéné, regarded every heraldic device or emblem of Scotch and Pictish kings as relics of Totemism in Scotland in historic times. A zealous opponent, who was ill received, as strongly advocated that they were relics of Baal. There was, however, very little of this kind of matter, the usual tone of the department being decidedly healthier, with the exception of a paper on spiritualism.

Mr. W. J. Knowles, offering remarks on the find of pre-historic objects at Portstewart in Ireland, and on the classification of arrow-heads, led to a discussion with Col. Lane Fox, who resisted the proposed amendments. Lieut. Cameron, coming in, made some happy identifications of Irish forms as being now in use in Africa, but of iron material.

Miss A. M. Buckland read a paper, 'On Primitive Agriculture,' a compilation which was well received as a contribution of facts bearing on this subject.

ZOOLOGY AND BOTANY. (SECTION D.)

THE address in this department by Prof. Alfred Newton, of Cambridge, one of the Vice-Presidents of the Section, was listened to with great interest as it was conspicuously non-technical, and dealt with subjects of general importance. He first alluded to what he denominated the two chief events in zoology during the past year—the return of the Challenger and the publication of Mr. Wallace's 'Geographical Distribution of Animals.' The collections secured during the expedition of the Challenger were, he said, now at Edinburgh, undergoing arrangement. He was glad to inform the Section that the best specialists were to describe the different groups: the Hydrozoa were to be entrusted to Prof. Allman, and the Polyzoa to Mr. Busk. An earnest hope was expressed that no unforeseen occurrence would interfere with the arrangement by which the Government were to pay for the publication of the works required to illustrate the spoils of the deep.

Prof. Newton, while not underrating the value of the Challenger Expedition, placed it second in importance to the issue of Mr. Wallace's great

work, the result of labour almost unsurpassed, and the starting-point of a new epoch in science. He knew, from personal experience of the difficulty of treating satisfactorily the geographical distribution of only one group of animals, what a feat Mr. Wallace had accomplished. With all his conclusions he could not agree, though many of them appeared to be justified by the present imperfect state of our knowledge. Especial attention was directed to the admirably cautious words in which the author takes leave of his readers—words that proved him to be thoroughly imbued with the right spirit of a true worker in a progressive branch of study.

Consideration was then given to the changes in distribution of animal and plant life now being produced, often thoughtlessly, by the hand of man. An amusing picture was drawn of the possible results of the extirpation of indigenous faunas in islands: the abundance of sparrows destroying all cereals; starlings consuming fruits; goats, rabbits, and pigs almost annihilating the flora. These were results that had already partially arisen, and would increasingly prevail unless careful measures were taken. The Professor believed that the next century would witness the extirpation of most of the peculiar island faunas, and the extinction of vast numbers of animals in various quarters. This he protested against, first in the name of science, which would suffer incalculably; then in the name of utilitarians, who would perhaps be aroused by perceiving that the extirpation of many animals which minister to our comfort or luxury would unfailingly occur. In this connexion the continued permission by the Board of Trade of the wholesale slaughter of seals by British hands was reprobated. Whatever other nations might do, our hands should be unstained in this matter.

The ever-increasing strain on our sea-fisheries, which must inevitably tend to the extinction of the most valued forms, notwithstanding their multitudes of individuals, was pointed to as fraught with danger. To the Report of the Royal Commission, which substantially advised that the fisheries should be left alone, he respectfully demurred. The balance of Nature must be seriously disturbed by human action, especially when so many fish were caught with the roe.

The concluding words of the address were wise and weighty. Had man's action on Nature always been that of a beneficent ruler? If not, it was incumbent on him no longer to oppose the course of Nature, but rather to second her preservative measures. There was happily a strong disposition to preserve British wild animals. This feeling should be extended beyond our islands. It was a feeling sanctioned alike by humanity, by science, and by our own material interests. Its propagation must not be left to humanitarians and sentimentalists, whose efforts were sure to be brought to nothing through ignorance and excess of zeal; nor to economists, whose endeavours would unquestionably fall short of what is required. The officiousness of the one class and the slackness of the other must equally be tempered by the naturalist. Only, to do this, the latter must place himself in the forefront of the movement; for he alone had that knowledge which gives the power of coping successfully with the difficult questions that would arise. "If, without offence, I might here paraphrase some venerable words, I would say that, according to the greatness of this power, we must preserve those that are otherwise appointed to die."

The Committee appointed to inquire into the possibility of establishing a "close time" for the protection of indigenous animals reported with great satisfaction the passing of Mr. Chaplin's Wild Fowl Preservation Act this year. A circular issued by the Committee and extensively distributed had materially contributed to this result. It is considered desirable that some further regulations should be applied to bird-catchers; but the difficulties in the way are so considerable that the Committee are not very sanguine of immediate success. The Sea Birds Preservation Act continues to work satisfactorily on the whole; but in some

districts a few prosecutions seem to be needed in order to its proper observance.

A discussion arose on a paper by Dr. Carmichael, entitled 'Spontaneous Evolution and the Germ-Theory,' in the course of which Dr. Carpenter gave an account of Dallinger and Drysdale's and also Tyndall's researches on the matter, according to all of them high praise. Some persons present appeared to think there had been no accurate researches on the subject, and that scientific men treated the matter most unscientifically.

Among the botanical papers was an account, by Prof. W. R. McNab, of the structure of the leaves in different species of *Abies* (Larches), which will shortly be published in full in the *Transactions* of the Royal Irish Academy. Prof. G. S. Boulger dealt comprehensively with the question of sex in plants.

Naturally, the accounts of deep-sea explorations attracted a large amount of attention. Mr. J. Gwyn Jeffreys read a paper, which will appear in the *Proceedings* of the Royal Society, on the results of the Voyage of H.M.S. *Valorous* to Disco Island last year. These supplemented in important respects those of the *Challenger*, which had not voyaged so far north as the arctic regions. Mr. Jeffreys spoke of the occurrence of large and small stones in his dredgings, and said that telegraph cables had usually been constructed too much on the supposition that the sea-bottom was always soft; consequently, they were very liable to damage where this was not the case. Scientific expeditions, he urged, must continually be sent out, if we wanted knowledge; all we had done yet was to scrape a few acres out of many millions of square miles. The example of the Scandinavian governments in energetic exploration was held up to high admiration. The number of molluscan species obtained by the *Valorous* was 183, of which forty were new; others occurred over a great range in space, and some had been found identical with Tertiary fossils of other districts. Mr. Jeffreys's opinion was that the fauna of Davis' Straits was much more European than American, and that a great westward migration had taken place. Dr. McIntosh, of St. Andrew's, commented upon the Annelids of the *Valorous* expedition; Prof. Dickie, of Aberdeen, on the Diatoms; and Dr. Carpenter on the Arenaceous Foraminifera, and supported Mr. Jeffreys in his views as to the predominating European character of the fauna of Davis' Straits.

Mr. J. Murray read a paper on Oceanic Deposits and their origin, based on observations on board the *Challenger*. In this he developed the novel view that a large proportion of the material of the deep sea-bottom was derived from submarine volcanic eruptions, and was nothing more than pumice dust. He thought he had never failed to find a piece of pumice when it was carefully looked for in any of the dredges. The detritus of modern land did not appear to be carried more than two or three hundred miles away from the shore. He discussed the question of the geological aspect of these deposits. Had they any geological equivalents in the stratigraphical series? If not, as some asserted, it would show that the great continents had remained substantially throughout very long geological periods. Sir Wyville Thomson, although he intimated some dissent from Mr. Murray's conclusions, said that his observations had been conducted with great care and unremitting attention.

GEOGRAPHY. (SECTION 2.)

The proceedings of this Section commenced on Thursday with an address from the President, in which, after alluding to the successful issue of Cameron's journey across Equatorial Africa, and other recent events of geographical exploration, he continued as follows:—

I trust, as one officially interested in the *Challenger* expedition from its inception, and as having in early days been engaged in kindred work, and also, as I hope, without being considered to have trespassed on the scientific territories of

these gentlemen—ground indeed so well earned—this meeting will view with indulgence my having selected as the leading theme of my address to it, a review of that branch of our science now commonly known as the "Physical Geography of the Sea"; combined with such suggestive matter as has presented itself to me whilst engaged in following up the proceedings of this voyage. We are indebted in our generation to the genius of Maury, aided originally by the liberal support of his Government, for placing before us, in the twofold interests of science and commerce, an abundant store of observed facts, accompanied, too, by those broad generalizations which, written with a ready pen and the fervour of an enthusiast, have charmed so many readers, and have undoubtedly advanced navigation in practice. In our admiration, however, of modern progress we must not in justice pass by without recognition the labours of earlier workers—Vanerius, Dampier, and Halley. To Rennell we owe an investigation of the currents of the Atlantic Ocean, which, for precision and a thorough conception of the conditions affecting the subject, will long serve as a model for imitation. At a later date we have, by Redfield, Reed, Thom, and others, solidly practical investigations of the gyration, and at the same time bodily, progressive movements of those fierce and violent storms which, generated in tropical zones, traverse extensive districts of the ocean; while the clear and elegant exposition by Dove of their law, and its application as one common general principle to the ordinary movements of the atmosphere, must commend itself as one of the achievements of modern science. While, for the moment, in the aerial regions, we must not forget the industry and scientific penetration of the Secretary of the Scottish Meteorological Society. His more recent development of the several areas of barometric pressure, both oceanic and continental, bids fair to amend and enlarge our conceptions of the circulation of both the aerial and liquid coverings of our planet.

The dawning efforts of science to pass beyond the immediate practical requirements of the navigator are worthy of note. We find—from a paper 'On the Temperatures of the Sea at different Depths,' by Mr. Prestwich—that in the middle of last century the subject of deep-sea temperatures first began to attract attention, and thermometers for the purpose were devised; but it was not till the early part of the present century that the curiosity of seamen appears to have been generally awakened to know more of the ocean than could be gleaned on its surface. John Ross, when in the Arctic seas in 1818, caught glimpses of animal life at the depth of 6,000 feet; other navigators succeeded in obtaining the temperature of successive layers of water to depths exceeding 6,000 feet, but, so far as I can ascertain, James Ross was, in 1840, the first to record beyond doubt that bottom had been reached, "deeper than did ever plummet sound," at 16,060 feet, westward of the Cape of Good Hope. The impetus to deep-sea exploration was, however, given by the demand for electrical telegraphic communication between countries severed by the ocean or by impracticable land routes. Science, aroused by the consideration that vast fields for biological research were opening up—as proved by the returns, prolific with living and dead animal matter, rendered by the comparatively puny appliances originally used for bringing up the sea-bottom—invoked the aid of Government. We have now reached, in all probability, a new starting-point in reference to many of our conceptions of the physics of the globe, and our own special branch may not be the least affected. There is opened up to us, for example, as fair a general knowledge of the depression of the bed of large oceanic areas below the sea level, as of the elevation of the lands of adjacent continents above that universal zero line. We learn for the first time by the *Challenger*'s results—supplemented as they have recently been by the action of the U.S. Government in the Pacific, and by a series of soundings made in the exploratory German ship-of-war *Gazelle*—that the unbroken range of

ocean lower features abyssal respect Atlantic records The general charts sive place There Ocean many sees at 15,000 Oceans founder place Atlantic common the se degree nearly and J. Atlantic tude, r 12,000 nearly undula stand t and A named running and wh Islands indeed of the conform character land, 1 80th p commo signific tion, a of the of wh fringe islands, below capitous This g the ent distanc feet is surpass the eco does th late att due pr ing wh earliest constan views to be r of the and m only in exting gre to gen to these such as and sot as far a dissent surface winds, gravity axis, th well-de present powers mem be produc prevail tinned

ocean in the southern hemisphere is much shallower than the northern seas, that it has no features approaching in character those grand abyssal depths of 27,000 and 23,500 feet found respectively in the North Pacific and North Atlantic Oceans, as the greatest reliable depths recorded do not exceed 17,000 or 17,500 feet. The general surface of the sea bed presents in general to the eye, when graphically rendered on charts by contour lines of equal soundings, extensive plateaux varied with the gentlest of undulations. There is diversity of feature in the western Pacific Ocean where, in the large area occupied by the many groups of coral islands, their intervening seas are cut up into deep basins or hollows some 15,000 or 20,000 feet deep. In the Northern Oceans one is struck with the fact that the profounder depths in the Pacific occupy a relative place in that ocean with those found in the Atlantic; both abyssal areas have this, too, in common,—the maximum depths are near the land, the sea-surface temperature has the maximum degree of heat in either ocean, and two of the most remarkable ocean streams—Florida Gulf and Japan—partially encompass them. In the Atlantic Ocean, from a high southern latitude, a broad channel, with not less than some 12,000 to 15,000 feet, can be traced, as extending nearly to the entrance of Davis Strait: a dividing undulating ridge of far less depression, on which stand the islands of Tristan d'Aunha, St. Helena, and Ascension, separates this, which may be named the western channel, from a similar one running parallel to the South African Continent, and which extends to the parallel of the British Islands. It is possible that certain tidal and, indeed, climatic conditions peculiar to the shores of the North Atlantic may be traced to this bottom conformation, which carries its deep, canal-like character into Davis Strait, and between Greenland, Iceland, and Spitzbergen, certainly to the 80th parallel. There is, however, one great feature common to all oceans, and which may have some significance in the consideration of ocean circulation, and as affecting the genesis and translation of the great tidal wave and other tidal phenomena, of which we know so little; namely, that the fringe of the seaboard of the great continents and islands, from the depth of a few hundred feet below the sea-level, is, as a rule, abruptly precipitous to depths of 10,000 and 12,000 feet. This grand escarpment is typically illustrated at the entrance of the British Channel, where the distance between a depth of 600 feet and 12,000 feet is in places only ten miles. As a question of surpassing interest in the great scheme of nature, the economy of ocean circulation, affecting as it does the climatic conditions of countries, has of late attracted attention. That ocean currents were due primarily to the trade and other prevailing winds, was the received opinion from the earliest investigation made by navigators of the constant surface-movement of the sea. Rennell's views are thus clearly stated:—"The winds are to be regarded as the prime movers of the currents of the ocean, and of this agency the *trade-winds* and *monsoons* have by far the greatest share, not only in operating on the larger half of the whole extent of the circumambient ocean, but as possessing greater power, by their constancy and elevation, to generate and perpetuate currents; . . . next to these, in degrees, are the *most prevalent* winds, such as the westerly wind beyond, or to the north and south of, the region of trade winds." Maury, as far as I am aware, was the first to record his dissent from these generally received views of surface currents being due to the impulse of the winds, and assigned to differences of specific gravity, combined with the earth's rotation on its axis, the movement of the Gulf Stream, and other well-defined ocean currents. A writer of the present time, gifted with high inductive reasoning powers, regards the various ocean currents as members of one grand system of circulation; not produced by the trade winds alone, nor by the prevailing winds proper alone, but by the continued action of all the prevailing winds of the

globe regarded as one system of circulation; and that without exception, he finds, the direction of the main currents of the globe to agree exactly with the direction of the prevailing winds. Another writer, who personally has devoted much time to the question, both in the ocean near our own shores and in the Mediterranean Sea, without denying the agency of the winds, so far as surface drifts are concerned, considers that general ocean circulation is dependent on thermal agency alone; resulting in the movement of a deep stratum of polar waters to the equator, and the movement of an upper stratum from the equator towards the poles; the "disturbance of hydrostatic equilibrium" being produced by the increase of density occasioned by polar cold and the reduction of density occasioned by equatorial heat; and that polar cold rather than equatorial heat is the *primum mobile* of the circulation. Analogous views had also been formed by continental physicists from sea temperature results obtained in Russian and French voyages of research in the early part of this century. We have here presented to us two distinct conceptions of ocean circulation—the one to a great extent confined to the surface, and horizontal in its movements, the other vertical, extending from the ocean surface to its bed, and involving, as a consequence, "that every drop of water will thus (except in confined seas) be brought up from its greatest depths to the surface." With these hypotheses before us, it may be fairly considered that the problem of "ocean circulation" is still unsolved. Possibly, too, the real solution may require the consideration of physical causes beyond those which have been hitherto accepted. In attempting the solution, it appears to me impossible to deny that the agency of the winds is most active in bringing about great movements on the surface waters: the effects of the opposite monsoons in the India and China seas furnishing corroborative proof. Again, the remarkable thermal condition of the lower stratum of the water in enclosed seas, as the Mediterranean, and in those basin-like areas of the Western Pacific cut off by encircling submarine ridges from the sources of polar supplies, combined with the equally remarkable conditions of cold water from a polar source flowing side by side or interlacing with warm water from equatorial regions—as in the action of the Labrador and Gulf streams—points to the hypothesis of a vertical circulation as also commanding respect.

A grand feature in terrestrial physics, and one which, I apprehend, bears directly on the subject before us, is that producing ice movement in the Antarctic seas. The Antarctic voyages of D'Urville, Wilkes, and James Ross assure us of the character of the ice masses in the Southern seas. Ross traced the ice barrier 250 miles in one unbroken line; he describes it as one continuous perpendicular wall of ice, 200 to 100 feet high above the sea, with an unvarying level outline, and probably more than 1,000 feet thick—"a mighty and wonderful object." Ross did not consider this ice barrier as resting on the ground, for there were soundings in 2,500 feet a few miles from the cliffs; Wilkes also sounded in over 5,000 feet, only a short distance from the barrier. There is singular accord in the descriptive accounts by Wilkes and Ross of this ice region; they both dwell on the difference in character of Antarctic from Arctic ice formation, on the tabular form of the upper surface of the floating icebergs, and their striated appearance; on the extreme severity of the climate in mid-summer; of the low barometric pressure experienced—and express equal wonderment at the stupendous forces necessary to break away the face of these vast ice barriers, and the atmospheric causes necessary for their reproduction. From the drift of this disrupted ice we have fair evidence of a great bodily movement of the waters northward; for it must be remembered that icebergs have been fallen in with in the entire circumference of the Southern seas, and that they are pushed in the South Atlantic ocean as far as the 40th parallel of latitude; in the

South Indian to the 45th parallel; and in the South Pacific to the 50th parallel.

In the discussion of ocean circulation, it has been assumed that water flows from Equatorial into Antarctic areas; there is no evidence, so far as I am aware, that warm surface water, in the sense implied, is found south of the 45th parallel. Surface stream movement northward and eastward appears to be that generally experienced in the zone between the Antarctic circle and that parallel. With, then, this great bodily movement northward of Antarctic waters included certainly between the surface and the base, or nearly so, of these tabular icebergs (and thus representing a stratum certainly some thousand feet in thickness), the question arises, How, and from whence, does the supply come to fill the created void? Sir Wyville Thomson, in one of the later of the many able Reports he has forwarded to the Admiralty, furnishes, I think, a reasonable answer. Stating first his views as derived from study of the bottom temperature of the Pacific Ocean generally, he writes:—"We can scarcely doubt that, like the similar mass of cold bottom-water in the Atlantic, the bottom-water of the Pacific is an extremely slow indraught from the Southern Sea." He then gives the reason:—"I am every day more fully satisfied that this influx of cold water into the Pacific and Atlantic Oceans from the southward is to be referred to the simplest and most obvious of all causes, the excess of evaporation over precipitation of the land-hemisphere; and the excess of precipitation over evaporation in the middle and southern parts of the water-hemisphere."

Before following up the great northward movement of Antarctic waters, I would draw attention to a physical feature in connexion with tidal movements, which possibly may be one of the many links in the chain of causes affecting ocean circulation. The mean tide level (or that imaginary point equi-distant from the high and low water-marks as observed throughout a whole lunation), has been assumed as an invariable quantity; our Ordnance Survey adopts it as the zero from whence all elevations are given: the *datum level* for Great Britain being the level of mean tide at Liverpool. For practical purposes, at least on our own shores, this mean sea-level may be considered invariable, although recent investigations of the tides at Liverpool and Ramsgate indicate changes in it to the extent of a few inches, and which changes are embraced in an annual period, attaining the maximum height in the later months of the year; these have been assumed as possibly due to meteorological rather than to the astronomical causes involved by tidal theory. From an examination of some tidal observations recently made near the mouth of Swan River, in Western Australia, during the progress of the Admiralty survey of that coast, there appears to me evidence that in this locality—open, it will be remembered, to the wide southern seas—the sea-level varies appreciably during the year; thus, the greatest daily tidal range in any month very rarely exceeds three feet, but the high and low water-marks range, during the year, five feet. The higher level is attained in June, and exceeds the lower level, which is reached in November, by one foot or more. At Esquimaux, in Vancouver Island, fairly open to the North Pacific Ocean, there are indications of the sea-level being higher in January than it is in June; and a distinct excess of the mean level of the tide by several inches in December and January, as compared with the summer months, was traced by the late Capt. Beechey, R.N., at Holyhead. If this surface oscillation is a general oceanic feature, and some further proofs indirectly appear in the Reports of the Tidal Committee to this Association for 1868, 1870, 1872, to which I have just referred,—for mention is also made of a large annual tide of over three inches, reaching its maximum in August, having been observed at Cat Island, in the Gulf of Mexico,—we may have to recognize this physical condition, that the waters of the southern hemisphere attain a high level at the period of the year when the sun is to the north of the equator,

and that the northern waters are highest at the period when the sun is to the south of the equator. This is a question of so much interest that I propose again to revert to it. Variations in the sea-level have been observed, notably in the central parts of the Red Sea, where the surface water, as shown by the exposure of coral reefs, is said to be fully two feet lower in the summer months than in the opposite season; these differences of level are commonly assigned to the action of the winds. Rennell, in his 'Investigation of the Currents of the Atlantic Ocean,' states that, on the African Guinea coast, the level of the sea is higher by at least six feet perpendicular in the season of the strong S.W. and southerly winds—which winds blow obliquely into the Bay of Benin between April and September, the rainy season also—than during the more serene weather of the opposite season; the proof being that the tides ebb and flow regularly in the several rivers during the period of strong S.W. winds, but that in the other season the same rivers run ebb constantly, the level of the sea being then too low to allow the tide waters to enter the mouths of the rivers. It is possible the cause, here and elsewhere, may in part be cosmical, and neither meteorological nor astronomical in a tidal sense. These several facts in relation to the variations in levels of the surface of the ocean are interesting, and point to new fields of observation and research. Another physical feature connected with the ocean level is deserving consideration: I refer to the effect of the pressure of the atmosphere. On good authority we know that the height of high water in the English Channel varies inversely as the height of the barometer. The late Sir John Lubbock laid it down as a rule that a rise of one inch in the barometer causes a depression in the height of high water, amounting to seven inches at London and to eleven inches at Liverpool. Sir James Ross, when at Port Leopold, in the Arctic Seas, found that a difference of pressure of '668 of an inch in the barometer produced a difference of nine inches in the mean level of the sea—the greatest pressure corresponding to the lowest level. These results appeared to him to indicate "that the ocean is a water-barometer on a vast scale of magnificence, and that the level of its surface is disturbed by every variation of atmospheric pressure inversely as the mercury in the barometer, and exactly in the ratio of the relative specific gravities of the water and the mercury." When we consider the exceptionally low barometric pressure prevailing in the Southern Seas, and the comparatively low pressure of the Equatorial Ocean zones as compared with the areas of high pressure in the oceans north and south of the equator—the latter features a late development by Mr. Buchan—these characteristic conditions of atmospheric pressures cannot exist without presumably affecting the surface conditions of adjacent waters. There is yet one more point in connexion with the ocean circulation which has not received the attention it demands; this is, the economy of those currents known as "counter equatorial." Their limits are now fairly ascertained, and are found to be confined to a narrow zone; they run in a direction directly opposite to, and yet side by side with, the equatorial streams of both the Atlantic and Pacific Oceans. They run at times with great velocity, and occasionally in the face of the trade wind; they are not merely local, stretching as they do across the wide extent of the Pacific; and in the Atlantic, during the summer months of our hemisphere, extending nearly across from the Guinea coast to the West India Islands. They have, too, this significant feature, that their narrow zone is confined to the northern side alone of the great west-going equatorial currents. This zone is approximately between the parallels of 7° and 10° N., and thus corresponds with the belt of greatest atmospheric heat on the earth's surface. That the functions of the counter currents in the physics of the ocean are important, must, I think, be conceded. They appear to act on their eastern limits as feeders to

the equatorial currents, and, from the seasonal expansion, which has been well traced in the Atlantic, are probably more immediately associated with some oscillatory movement of the waters, following, though perhaps only remotely connected with, the sun's movements in declination. A brief summary of the thermal conditions of the oceanic basins will now enable us to review the salient features of ocean circulation, and the more immediate scientific position the question has assumed. In all seas within the torrid and temperate zones, provided any given area is not cut off by submarine barriers from a supply of polar or glacial water, the sea bed is covered by a thick stratum of water, the temperature of which is confined between 32° and 35° F. In the Pacific Ocean this cold stratum must be derived from Antarctic sources, for the opening of Behring Strait is too small to admit of an appreciable efflux of Arctic waters. In this ocean the cold stratum obtains generally at depths below 9,000 feet from the surface, with an almost invariable isothermal line of 40° F., at from 2,500 to 3,000 feet from the surface. Similarly, in the Indian Ocean basin, the cold stratum at the bottom is derived from Antarctic sources, for the temperature of 33·5° F. underlies the hot surface waters of the Arabian Gulf. In the South Atlantic, Antarctic waters, with a bottom temperature of 31° to 33·5° F., certainly cross the equator; the bed of the North Atlantic basin then warms up to 35°—marked diversities in both the temperatures and thickness of the successive layers of water from the surface downwards are found; and in the central parts of the basin it is not until the vicinity of the Farøe Islands is reached that Arctic waters of an equivalent temperature to those from Antarctic sources are experienced.

Turning now to the scientific aspect of the question:—The doctrine of a general oceanic thermal circulation assumes two general propositions: 1, the existence of a deep under-flow of glacial water from each pole to the equator; and 2, the movement of the upper stratum of oceanic water from the equatorial region towards each pole, as the necessary complement of the deep polar under-flow—this double movement being dependent "upon the disturbance of hydrostatic equilibrium, constantly maintained by polar cold and equatorial heat." Proposition 2, in its general application as to the movement of surface waters, is unquestionable; but that of a deep under-flow from the poles, as a necessary complement, remains open to doubt. Proposition 1, in its wide generality, must, from what we know of the Pacific, be confined to the Atlantic Ocean; and it appears to me that it is on the interpretation of the movement of the waters in its northern basin that the hypothesis of a vertical circulation and the potency of thermal agency in bringing it about must be judged.

We have followed the movements of Antarctic waters in the Atlantic to the 40th parallel, as illustrated by the progress of icebergs; we know that the movement deflects the strong Agulhas current, and that the cold waters well up on the western shore of the South African continent, cooling the equatorial current near its presumed source; the thrusting power of this body of water is therefore great. About the equator it rises comparatively near to the surface. But we now come to another and distinct movement—the equatorial current; and on this, I apprehend, the material agency of the winds cannot be denied, in forcing an enormous mass of surface-water from east to west across the ocean. The Gulf Stream results, and the comparative powers of this stream, as especially influencing the climate of our own and neighbouring countries, together with the forces at work to propel its warm waters across the Atlantic, have become the controversial field for the upholders of horizontal and vertical circulation. The one hypothesis assigns to the Gulf Stream all the beneficent powers of its genial warmth which have been conceded to it from the time of Franklin. The other hypothesis reduces its capacity, considers that it is disintegrated in mid-Atlantic, and that the modi-

fied climate we enjoy is brought by prevailing winds from the warm area surrounding the stream; and to this has been more recently added, "by the heating power of a warm sub-surface stratum, whose slow northward movement arises from a constantly renewed disturbance of thermal equilibrium between the polar and equatorial portions of the oceanic area." Without denying the active powers of this disturbed thermal equilibrium—although in this special case it is an abstraction difficult to follow—and giving due weight to the many cogent facts which have been brought forward in support of both views, there appears to be still a connecting link or links wanting to account for the southern movements of Arctic waters, which movements, to me, are even more remarkable as a physical phenomenon than the translation of the warm waters from the Gulf Stream area to a high northern latitude. This movement of Arctic waters is forcibly illustrated by the winter drifts down Davis Strait of the ships *Resolute*, *Fox*, *Advance*, and of part of the crew of the *Polaris*, when enclosed in pack ice, exceeding in some cases, 1,000 miles; similarly, of the winter drift of a part of the German expedition of 1870, down the east side of Greenland, from the latitude of 72° to Cape Farewell. If to these examples we add the experience of Parry in his attempt to reach the North Pole from Spitzbergen in the summer of 1827, it must be inferred that a perennial flow of surface water from the polar area into the Atlantic obtains, and, judging from the strength of the winter northerly winds, that the outflow is probably at its maximum strength in the early months of the year. When we further know that the northern movement of warm waters gives, in winter, a large accession of temperature to the west coast of Scotland, to the Farøe Islands, and extending to the coasts of Norway as far as the North Cape; the consideration arises whether this onward movement of waters from southern sources is not the immediate cause of displacement of the water in the Polar area, and its forced return along the channels indicated by those winter drifts to which I have referred. That some hitherto unlooked-for cause is the great agent in forcing southern waters into the Atlantic polar basin has long forced itself on my conviction, and I now suspect it is to the cause producing the annual variations in the sea level,—for, as I have mentioned, indications exist of the seas of the northern hemisphere having a higher level in winter than in summer,—that we must direct our attention before the full solution of ocean circulation is accepted. The facts of the annual changes of sea level, whatever they may ultimately prove, have hitherto ranged themselves as part of tidal action, and so escaped general attention. Physicists well know the complication of tidal phenomena, and, if one may be permitted to say, the imperfection of our tidal theory; certain it is that the tides on the European coasts of the Atlantic are so far abnormal that one of our best authorities on the subject (Sir William Thomson) describes them, in relation, I assume, to tidal theory, as "irregularly simple," while the tides in all other seas "are comparatively complicated, but regular and explicable." However this may be, specialists should direct their attention to the disentangling of the variations in the sea level from tidal action simple; and our colonies, especially those in the southern hemisphere, would be excellent fields for the gathering in of reliable observations. I am unwilling to leave the subject without tracing some of the consequences that might be fairly considered to follow this assumed change of level in the North Atlantic basin. We can by it conceive the gradual working up of the warmed water from southern sources as the winter season approaches, including the expansion of the Gulf Stream in the autumn months; the consequent welling up of a head of water in the enclosed and comparatively limited area northward of Spitzbergen, Greenland, and the broken land westward of Smith Sound; the forced return of these glacial waters, their greatest volume seeking the most direct course, and thus working down the Labrador coast charged with ice, and passing

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the American coast inside the Gulf Stream; while the smaller volume, reaching the higher latitudes in mid-Atlantic, interlaces with the warm barrier waters, causing those alternating bands of cold and warm areas familiar to us from the Lightning and Porcupine observations, and which are now being worked out by the Norwegian exploring expedition in the Vöringen. We can further conceive that the larger function of the "counter currents" on the north margin of the great equatorial streams is to act as conduits for the sur-charged waters of the northern oceans consequent on the gradual changes of level. The Atlantic counter-current, we know, expands markedly in the autumnal season, and there may be some connexion between this expansion and the high level of the waters said to exist in the Gold Coast and Guinea bights at the same season.

We are thus, as it appears to me, now only on the threshold of a large field of inquiry bearing on the physical geography of the sea; but we have this advantage, the discussions which have taken place in the past few years, productive as they have been of the marshalling hosts of valuable facts, will lighten the labours of those who engage in its prosecution. Science is deeply indebted to, and, I am sure, honours, those who have so earnestly worked on the opening pages of the coming chapter on ocean circulation.

The first paper after the President's address was one by Mr. Octavius C. Stone, on his journeys in the interior of New Guinea, read by the traveller himself, who has recently returned to England. He said that, whilst preparing at Somerset, Cape York, a private expedition into the interior of the eastern portion of this great island, he was invited by the Rev. S. MacFarlane, of the London Missionary Society, to accompany him in his voyage up the newly discovered Mai-Kassa River (opposite Cape York), in the steamer Ellangowan. In the course of this first exploration in New Guinea, he penetrated about ninety miles inland, continuing the journey in a boat from the point where the river ceased to be navigable by the steamer. The whole coast-country here and along the western side of the Gulf of Papua was flat and clothed with uninteresting mangrove-forests; but beyond the flat zone the ground becomes more undulating, the forests more varied, and animal life more abundant. He succeeded, near the head waters of the Mai-Kassa, in shooting specimens of the new Bird of Paradise (*Paradisea Raggiana*). The lower part of the stream, like that of the neighbouring "Fly River," was within tidal influence, and the water was salt or brackish. But it differed from the populous region of the "Fly" in being almost destitute of native inhabitants, the section of Papuans tenanted both districts being that of the "Daudés." Returning to Cape York, the author completed his arrangements for an attempt to cross the south-eastern peninsula. He engaged two practical naturalists, left there by the Macleay Expedition, and proceeded to Port Moresby, where, after vainly endeavouring to enlist native carriers, he started on his land journey. Striking across the comparatively barren coast country, he reached, after a march of fifteen miles, the Laroki River, which he believes to be the upper course of the Manumanu, disemboguing in Redscar Bay. Crossing this, and continuing in a north-easterly direction, he succeeded in attaining, on the 9th of December, 1875, the lower hills of the Stanley mountain range, his furthest point being the village of Farúnamo, altitude 1,200 feet. Mount Bitoka (Mount Owen Stanley), the highest summit in this portion of the range, towered up to its altitude of 13,205 feet, beyond a series of transverse ridges graduating upward from Farúnamo. The native villages were numerous, and the people suspicious, but not aggressively hostile. In the absence of all assistance on their part, it was impossible to continue the journey. Although all belonging to the same light-coloured division of the Papuans, Mr. Stone remarked great differences of disposition, customs, and language between the interior hill tribes and the people of the maritime villages of Port Moresby. The hill country was also much more richly timbered

and more fertile. This light-coloured race are scarcely so tall as the dark Papuan of the western part of New Guinea, but they are muscular, and present a more pleasing expression of features. Their intelligence is far superior; they are docile, eager to learn, of a vivacious, laughter-loving temperament, and regard the cannibal propensities of their western neighbours with loathing and disgust. Mr. Stone found so much resemblance between this race, which peoples the whole of the south-eastern extremity of New Guinea, and the Eastern Polynesians, that he was compelled to the conclusion that they are immigrants from the east, who, having at a remote period landed on the shores, had dispossessed the original Papuan inhabitants.—A paper followed, by Mr. Kerry Nicholls, "On the Islands of the Coral Sea," detailing the author's experiences and observations during a recent voyage to the New Hebrides and the neighbouring groups of islands.

On Friday, a large audience assembled to hear Lieut. Cameron discourse on the subject of his recent journey across Africa. The special feature of the lecture was a review of the water-sheds of Central Equatorial Africa, in connexion with the prospects of river navigation, and the future opening-up of the region to commerce and civilization. The fertility and resources of the western part of the interior, from Lake Tanganyika to Benguela, were dwelt upon. This vast, well-watered, productive, and healthy region was at present nothing but a great slave-preserve for the low-caste Portuguese slave-dealers on the frontiers of the Portuguese possessions. A little ivory was dealt in, but only as subsidiary to slaves, which were not taken in any numbers to the coast towns, but re-conveyed to the tribes on the upper and middle Zambesi and there disposed of.—In the course of the discussion which followed, Mr. Stephenson (of Glasgow), speaking with reference to the Scotch Churches' Mission on Lake Nyassa, informed the Section that some of the promoters of that mission had in contemplation the placing of steamers on both Lake Nyassa and Lake Tanganyika, and wished to take the opinion of geographers with regard to the feasibility of exploring the interval which separated these two great sheets of water. Lieut. Cameron stated that it was probable the direction of Lake Nyassa, as represented on our maps, was not the true one, owing to errors in reducing the compass bearings, and that the two lakes occupied portions of the same immense trench which furrowed Central Africa from north to south. If his surmises were correct, the extremities of the lakes would approach very near to each other. The establishment of steamers on these lakes would put an effectual end to the slave traffic with the east coast.

Lieut.-Col. R. L. Playfair (H.M. Consul-General in Algeria) then read an account of part of his recent exploration in the regency of Tunis. He reminded the meeting that Bruce, the Abyssinian traveller, had held the position of Consul-General in Algeria from 1762 to 1765, and that before undertaking his great journey to the sources of the Blue Nile he had made extensive explorations in Algeria, Tunis, and the Cyrenaica, the results of which have never yet been published. His MSS. were lost in a shipwreck, but he left an immense collection of drawings of extraordinary merit, which have remained since his death shut up in the muniment room of Kinnaird. Of these his Barbary sketches are the most interesting. They contain about 120 sheets of drawings completely illustrating the archaeology of North Africa, and these had been placed at Colonel Playfair's disposal for publication, by Bruce's descendant and heiress, Lady Thurlow. Colonel Playfair determined to follow Bruce in his journey, and to convince himself of the present condition of those interesting ruins which are almost unknown to the modern traveller. This he had just carried out; and on leaving the regency of Tunis had travelled overland to Algeria, through the country of the Khomair, south of the island of Tabasca and the French frontier town of La Calle, which has never before been visited by a European. He

and his companion, the Earl of Kingston, made this part of their journey quite alone, having dismissed their escort, and even their servant, on the frontier. They were accompanied only by a few members of the tribe itself. The Khomair is the most numerous and warlike tribe in the regency. It consists of about 20,000 fighting men, who are perfectly independent, and own no allegiance to the Bey, save that they recognize their obligation to guard the frontier in his behalf; and so well do they execute this duty, that they have never hitherto permitted a Christian, and hardly even a strange Arab or Jew, to pass through their territory. Colonel Playfair thus describes the manner in which he and his companion succeeded in gaining their affection:—"No sooner was our tent pitched than a great circle of wild-looking fellows gathered round us and watched our movements with wondering gravity. They, however, allowed us to finish our meal without interruption, which done, we commenced to amuse them by the exhibition of compasses and barometers, tricks with pocket handkerchiefs and bits of strings; and Lord Kingston, who is an unerring shot, astonished them by the accuracy of his aim. I do not think, however, that it was till we produced a pot of jam, and distributed it to the assembly, that we entirely succeeded in gaining their affections. Suddenly they thawed in a most amusing manner, and we became the best possible friends. They declared that we must never leave them. They would give us lands and sheep; and as for wives, the full legal number of four was at our service on the most reasonable terms. They at once offered to escort us to La Calle, or to take us to any part of their country we pleased to visit."

The travellers crossed the Oued-az-Zan, the ancient Tusca, and ascended the valley of the Oulad Siders, and so entered French territory. The country is extremely beautiful and fertile. It is a high mountain range, traversed by numerous streams, and covered with magnificent forests, principally of oak. It is, moreover, rich in minerals. They picked up a specimen of lead ore, which subsequent analysis proved to contain 72.70 per cent. of pure metal, and five ounces of silver per ton. They crossed a remarkable district, where the forest is being slowly, but surely, engulfed by sand, blown up from the sea by the prevailing north-west winds. They also went to the Island of Tabasca, now rarely visited by travellers, but which has a most interesting history. From the earliest ages it has been the resort of Spanish and Italian coral fishers. It was ceded to the Genoese in 1535 as ransom for the noted pirate, Dragreth. It was subsequently fortified by Charles the Fifth, whose castle still crowns the summit; and it was finally taken, in 1741, by the Bey of Tunis, who carried off the inhabitants into slavery. Bruce was exceedingly anxious that it should be taken by the English, and several French travellers have been as anxious to obtain it for their Government. It was, no doubt, a most important strategic position before the introduction of steam navigation, as there was excellent anchorage for vessels of a small burden, but now it would be valueless.

The next paper was 'On the District of Akem, West Africa,' by Capt. J. S. Hay. This district, visited by the author in the course of his official duties at Accra, was described as lying between 6° and 7° north latitude. With the exception of a small portion, the whole country consists of mountain ranges, densely covered with primeval forests. The four chief rivers that water the country are the Berem, the Densu, the Bompong, and the Pompong; these, though never dry, are unnavigable, owing to numerous shoals and waterfalls. The entire country is auriferous in a high degree, but the inhabitants content themselves with digging circular holes to obtain the gold, in the shape of small nuggets and dust, the latter being also found in the rivers and water-courses. The forests are rich in timber woods, and if they were gradually cleared, the wood, sent to the coast, would prove valuable, but at present there is an utter lack of transport. The soil is a heavy

tenacious, red clay, quartz strata cropping up in every direction, and is so rich as to be capable of growing cotton, rice, ginger, coffee, and tobacco in almost boundless quantity. The climate is throughout the year humid. The most noteworthy feature in the ethnology of the district is a strange malformation amongst the men. It is confined to the male sex, and consists in a protuberance or enlargement of the cheek bones under the eyes, which takes the form of horns on each side of the nose. This malformation begins in childhood. It presents no appearance of being a diseased structure, nor is it a raised cicatrix. On the contrary, the author had seen children with this peculiarity of structure, whose parents were doing their utmost to stop it. As regards their religious belief, the popular idea is very wide of the actual truth. They are popularly supposed to be merely worshippers of pieces of wood and stone. They have, it is true, a multiplicity of deities, but their worship of them differs very essentially from the common notion current about it, and long before the Christian doctrine was brought to their country, they entertained a clear and remarkably developed idea of a one supreme God. He is, by them, considered to be the Father, and Earth the mother, of the universe. They call Him *Anyankopong*, a name never pronounced in the plural form, and never given to any of the minor deities.

Mr. A. Bowden read a paper 'On a Proposed New Route to the Sources of the Niger.' After reviewing the attempts of Major Laing and Winwood Reade to reach, from Sierra Leone, the head-waters of the Niger, the author remarked that fresh attempts in the same direction, at the present time, would probably be successful. Whilst residing in Liberia he had himself made a journey into the interior as far as Bopora, with a view to ascertaining the chances of success by that route. According to the information he received from the Mussulman and Mandingo chiefs at that place, he thought a traveller might be able to penetrate from that place, *vid* Musardu, by joining one of the regular caravans starting thence.

A paper 'On the White Nile, between Gondokoro and Affuddo,' by Lieut. W. H. Chippendall, R.E., concluded Friday's sitting. The author was engaged, between 1873 and 1875, under Colonel Gordon, in the important work of establishing stations on the portion of the Upper Nile between Gondokoro and Albert Nyanza, which had been stated by all previous travellers to be unnavigable on account of its numerous cataracts. The result of the operations was to prove that the supposed obstacles were easily surmountable, with the exception of the last or most southerly, viz., the falls of Makedo; which, nevertheless, Lieut. Chippendall appears to think, would not prevent "a Thames tug, leaving England, from mounting the Nile to Albert Nyanza, if she chose her time." The fall between Affuddo and Assua, a distance of fifteen miles, is 222 feet; between Assua and Bedden (eighty miles) 286 feet; and between Bedden and Gondokoro (twenty miles) 75 feet. But the steep gradient of 15 feet per mile, in the first of these sections, is chiefly taken up in the cataract of Makedo, rendering the river both above and below navigable. Colonel Gordon succeeded in taking two large iron boats, and a small steamer, up to the foot of the Makedo falls. The rapids were found by the author to be caused by the peculiar way in which the hard rocky strata across the bed of the river have been eroded. They form a succession of transverse ridges, dipping to the north, so that the water flowing from the south strikes against them and curls upwards, forming all sorts of eddies, backwaters, and whirlpools. The paper gave numerous interesting details regarding the river navigation, and the formation of the various military stations along the banks.

The proceedings of the Section were resumed on Monday by a paper from Commander T. H. Tizard, R.N., 'On the Temperatures obtained in the Atlantic during the Cruise of the Challenger.' In all oceans, he said, except in the immediate vicinity of ice, the temperature of the water was

found to decrease as the depth increased. In a number of cases this decrease of temperature continued to the bottom, but in many instances, after a certain depth no decrease took place. Thus in the Sulu Sea, from the depth of 400 fathoms to the bottom the water remained at the uniform temperature of 50½°. In the Celebes, China, and Banda Seas there was a uniform temperature from 700 to 900 fathoms to the bottom, and so forth. The reason why in some parts of the ocean there is no decrease beyond a certain depth, is that at that depth a submarine ridge exists, producing a closed basin, from which the colder bottom-water of the rest of the ocean is excluded. Over a great portion of the Atlantic the bottom temperature has this peculiarity. If the depth be less than 2,000 fathoms, the temperature at the bottom is lower than that of any intermediate depth; but when the depth exceeds 2,000 fathoms, the bottom temperatures are nearly the same as they are at that depth, no matter how much the depth may exceed 2,000 fathoms, and this holds good for three-fourths of the ocean. In the remaining fourth the temperatures obtained at the bottom are much lower than in the other parts; and this fourth is not at either extreme, where there is a large amount of surface cold, but occupies the whole of the western portion of the South Atlantic as far north as the Equator. The author then gave in some detail a classification of the temperatures obtained along various meridional, parallel, and diagonal lines across the Atlantic, showing that a nearly uniform bottom temperature of 35°·3 is found over three-fourths of the area of that ocean. In the remaining fourth, viz., from the East Coast of South America to a line joining Tristan d'Acunha with Ascension, and from the Equator to the southward, the bottom temperature varied from 31° to 33°·5, 32°·4 being found as far northward as 1° 45' south, in 2,475 fathoms. The coldest water is thus confined to the bottom portion of the western half of the South Atlantic. In the Atlantic serial temperatures were obtained by the Challenger at 125 positions, 82 north, and 43 south of the Equator. Up to 40° lat. there is a much larger amount of warm water in the North than in the South Atlantic.

A paper followed, by Mr. J. Murray, of the Challenger Expedition, 'On the Geographical Distribution of Ocean Deposits,' which had previously been read in another Section. A third paper, on the results to physical geography of the Challenger voyage, was read by Mr. J. Y. Buchanan, entitled, 'On the Specific Gravity of the Surface-water of the Ocean.' The general conclusion to which Mr. Buchanan arrived was that the salinity of the surface-water of the equatorial zone was much greater than that of the tropical zones on either side, that it decreased again gradually from the tropics towards the poles, and that the Atlantic was much more saline than the Pacific. In the discussion which followed, Mr. Buchanan stated that there could be no doubt that the lower salinity near the Equator was due to the excess of precipitation over evaporation. Incidentally he described the great disintegrating power of the tropical rain-fall on the rocks, especially granite, of tropical lands, owing to its high temperature. To this, he said, was due the thick stratum of fertile red soil which overlaid all the land, not alluvial, of Brazil.

Prof. Porter (of Belfast) then read a paper 'On some Points of Interest in the Physical Conformation of Antiquities of the Jordan Valley.' Syria, Palestine, and Arabia Petrea, he said, are divided from north to south by a valley which runs through six degrees of latitude. Its northern section forms the bed of the river Orontes, its southern section is an arid desert lying between Edom and the "Wilderness of Wandering," and its central section is the bed of the Jordan. For a length of 150 miles the surface of the latter is below the level of the ocean, and at the Dead Sea it has a depression of 1,292 feet. The Jordan has two chief sources, one amid the ruins of Caesarea-Philippi, the other four miles distant, on the site of the old Phœnician town of Laish, the Dan of the Israelites. The

united streams fall into Lake Hûleh, the Oulatha of Josephus, and Merom of the Bible, a sheet of water four miles long, and having an elevation of only 120 feet. After leaving the Hûleh, the Jordan descends through a chasm, between cliffs of basalt, to the Sea of Galilee, falling about 800 feet in eight miles. The Sea of Galilee is twelve miles long by eight wide. The basin in which it lies resembles the crater of a volcano. The hills on each side are chiefly basalt, overlying strata of Jura limestone. There are many evidences around the sea of recent volcanic action. On its western shores are the warm baths of Hammath; and in the wild ravine of the Hieromax, on the east, close to the site of Godara, are the more celebrated baths of Amatha. The geological structure of the great valley south of the sea is of the same age as the basin. The bed of the valley is flat, formed of a thick alluvial deposit, overlying thin beds of gypsum and marl, all of much more recent origin than the adjoining mountains, which are Jura limestone. The river runs in a deep ravine, some 400 yards wide, cut through the deposits of the valley, and appears to have been at one time much larger than it is now, covering the whole bed of the ravine. At present it is confined to a narrow channel, from 100 to 150 feet wide, while the rest of the bed of the ravine is covered with jungles of tamarisk and willow, intermixed with fertile meadow land. In spring, when the snow is melting, and the fountains copious, the Jordan overflows its inner banks, and occasionally covers the entire bed of the ravine, illustrating the statement in Joshua iii. 15. The Dead Sea is shut in on the east and west by lines of high cliffs of white limestone. It is forty geographical miles long, by eight and a half wide. It is divided into two sections by a long promontory called Lisân, "the tongue." The northern section is a very deep and regularly shaped basin; the southern is very shallow. The shores are generally bare and desolate. The researches of M. Lartet have shown that the elevation of the watershed of the great valley opposite Petra is 787 feet, and that consequently the Jordan could never have flowed into the Red Sea, since the action which upheaved the watershed was coeval with that which gave the whole of Palestine its present form. He accounts for the depression of the Jordan valley thus: A fracture took place in the upper strata of the region; in consequence of unequal strength the eastern edge remained *in situ*, forming the ridge of Gilead and Moab, while the western edge sunk down, so as to form the deep chasm of the valley. The cavity has been in all ages, since its formation, a reservoir for rain and fountains. At first it was full, but gradually the water has diminished by evaporation. M. Lartet saw many evidences of recent volcanic action on the shores of the Dead Sea. He does not touch questions of great interest, which are as follows:—1. Is there any evidence that the extent of the Dead Sea has been altered within the historic period? 2. Are there any traces of fire upon the more recent beds of gypsum, bitumen, or marl? 3. Have the bituminous eruptions which are known to have taken place been so extensive as to cause, if ignited, such a conflagration as is said to have occurred at the destruction of Sodom? More recent researches of Tristram and Poole bear upon these questions, but require farther confirmation. Tristram found layers of sulphur and bitumen mingled with sand, and bearing traces of the action of fire, along the south-western shores of the Dead Sea; and Poole states that the deposits on the promontory of Lisân contain fragments of sulphur and bitumen. Tristram concludes his observations thus:—"So far as I can understand this deposit, if there be any physical evidence left of the catastrophe which destroyed Sodom, we have it here." These points are worthy of investigation. The problems of the Dead Sea must be solved, if solved at all, not by theological dogmatism, but by scientific research. Traces of ancient shore-lines have been discovered along the mountain sides east and west of the Dead Sea, at various elevations, from the level of the ocean down to the present level of the lake. These also

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are worthy of fuller and more systematic examination by practical geologists. In the Jordan valley are a large number of remarkable mounds, many of them evidently artificial, and similar to those in the valley of the Orontes and plain of Damascus, some of which are of Assyrian origin. Prof. Porter thought that excavation might bring to light precious relics of ages long past and people long forgotten.

ECONOMIC SCIENCE AND STATISTICS. (SECTION F.)

THIS Section appropriately, in the centenary year after the publication of the 'Wealth of Nations,' met at Glasgow, where Adam Smith, who was no less a statistician than an economist, began his philosophical career, and where he learned lessons respecting the real phenomena of the economic world, which too many of his successors have overlooked. The President of the Section, Sir George Campbell, dwelt, in the opening part of his address, on the importance of statistics for the cultivation of economic science by the inductive method, which in every country in Europe is now superseding the *a priori* and deductive method; and he might well have instanced the 'Wealth of Nations' as affording, notwithstanding its author's excessive confidence in assumed natural economic laws, an excellent example of the combination of statistical and historical or inductive investigation with economic theory. The historical method in political economy, which eminent English writers have begun to advocate, is only another name for the inductive method; and statistics form simply a part of the historical investigation which the inductive method demands, although only some of the later links of the historical chain can be exhibited in statistical form, because only in recent times have facts relating to the condition and progress of States—the true meaning of Statistics—been carefully and methodically collected.

A prominent characteristic of Sir G. Campbell's address was the great extent and variety of the ground over which it travelled, giving an appearance of want of unity and connexion between some of the subjects discussed in it: the local institutions of India, the tenure of land, the economic results of small farms, poor laws, the depreciation of silver and Indian currency, education, the employment of women, the effects of alcohol, tobacco, and opium, punishment and flogging. There are economists of the deductive school who would deny altogether any connexion between some of these subjects and economic science. To these, as well as to those who, without determining the province of political economy by so narrow a boundary, yet miss a thread of connexion between all the various topics referred to, Sir G. Campbell might, perhaps, reply that all matters affecting, directly or indirectly, the economic condition of society are connected both with political economy and with each other. Yet convenience of classification and inclusion within a common scientific boundary often depend on degree of relationship, not on the bare fact of the existence of some relationship, however remote. A true classification, as Mr. Herbert Spencer has pointed out, includes in each class those objects which have more characteristics in common with one another than any of them have in common with objects excluded from the class. Following this principle, we should suggest that flogging, for instance, considered as a deterrent from crime, has indeed a distant connexion with the economic condition of society, but one so distant that, to employ a legal phrase, it may well be considered almost "void for remoteness." And, although Sir G. Campbell's address had the great merit of bringing into view the important truth that economic phenomena are simply social phenomena looked at on their economic side, and that all social phenomena have an economic side, it seems to us to have wandered a little at some points beyond the proper province of the Section. The range of statistics is, no doubt, a very wide and indefinite one, yet for the purpose of convenient handling in a single scientific depart-

ment, it ought hardly to be allowed the utmost latitude.

One of the subjects touched on in Sir G. Campbell's address, namely, the employment of women, certainly involves an economic question of the highest importance; but we entertain great doubt that much light can be thrown upon it by the inquiry which he suggested. "Is there not," he asked, "great room for scientific inquiry how far the mind of woman differs from that of man? Is there not, in fact, a very considerable mental difference between man and woman, just as there is a considerable bodily difference?" There are, we submit, serious objections to this mode of dealing with the subject. In the first place, women have, in some respects, doubtless a similar physical structure; but there are also immense differences, both physical and mental, between individual women; and women ought no more to be lumped together as regards capacity and fitness for employments than men. Adam Smith, indeed, regarded men as much alike in point of natural capacity. It harmonized with his view of the effects of division of labour, as also with his assumption of the regulation of the economic world by universal laws of human nature, to deny any considerable diversity of natural talents and tendencies, and to regard "the difference between the most dissimilar characters, between a philosopher and a common street porter, for example," as arising "not from nature, but from habit, custom, and education." But it must be confessed that Smith's mental philosophy was not very profound; and, even without going deep into the subject, he might have observed that brothers brought up in precisely the same way often display great diversity of character and capacity almost from infancy. When Sir G. Campbell concludes, from the bodily differences between men and women, that there must be considerable mental differences too, he is driven by his own analogy to admit the existence of great mental differences between individual women, since there are great bodily differences. So that the inquiry, What are the employments suited to women? seems to involve a fallacy of generalization of a kind which has been the bane of political economy; leading, for instance, to the deduction of "economic laws" from assumptions respecting "individual interest," as though individual interest were in all cases the same. It cannot be discovered *a priori*, or otherwise than by observation in a fair field in which both sexes develop their powers and tendencies with equal liberty, whether there really are considerable mental differences between man and woman, and if so, what these differences are. Adam Smith's proposition, that the difference between the philosopher and the porter results simply from education and habit, is open to the obvious reply, that on his own principle the resemblances, intellectual and moral, between the individual labourers of a given class, agricultural labourers for example, arise mainly from common conditions of training and pursuit, not from natural and inherent similarity of qualities. In like manner, the resemblances of character in women are in a great measure the results of common conditions of environment and education, as is manifest from the differences of character in the women of different countries, England and Turkey, for instance.

The question of most immediate concern to which Sir G. Campbell adverted in his address was also discussed in papers subsequently read before the Section, namely, the depreciation of silver, especially in connexion with the Indian exchanges. The subject is one bristling with controversies both theoretical and practical, on which foreign economists, in particular M. P. Leroy Beaulieu, E. De Laveleye, and H. Cernuschi, representing different views, seem to us to have thrown more light than it received from the Economic Section of the British Association. But, from the nature of the case, much still remains in obscurity. The future value of silver depends on conditions, partly physical, partly of policy on the part of various States, which are of necessity unknown. The future productiveness of the silver mines is an

unknown quantity; the currency policy of France, Austria, Russia, and the United States, not to speak of other countries, cannot be foretold; so that we are at present without data respecting both demand and supply on which to found either predictions or practical measures. For instance, it was suggested in the Section to put more silver into the rupee, in order to make ten rupees equal in real value to the pound sterling or sovereign; but no one can say how much silver would be necessary for that purpose six months hence. Such a measure would likewise involve a recoinage of the whole silver currency of India. It is a law of currency, as Mr. Jevons shows in his excellent treatise on 'Money and the Mechanism of Exchange,' that better money will be driven away by worse, since people will always pay in the cheapest medium. The new rupees accordingly would disappear as fast as they were coined, unless the old ones were at the same time called in and replaced, a proceeding involving almost insuperable difficulties besides enormous expense. Sir Charles Wood, when Secretary for India, let the opportunity slip for introducing a gold currency by degrees. It is now easier to say what ought not than what ought to be done. Yet the importance of ascertaining what not to do is sufficiently shown by a proposal recently made in a very influential quarter to compel the Indian rhyot to compensate the Government for the fall in silver, although the prices of his own produce have sustained no corresponding rise, and no compensation would have been made to him had silver, on the contrary, risen in India and Europe alike.

Several other subjects, including a Report on valuation for the income-tax, drawn with considerable skill by Mr. P. Hallett, of Bristol, were discussed in the Section. As regards the last subject, the great difficulty arises from the fact that individuals in trade and professions ought to be taxed in proportion to the income they actually and individually net, not in proportion to the ideal income which actuaries, following a system of averages, may assume them to have; and this difficulty does not seem likely to be ever completely removed; but indirect taxation, too, proceeds on assumptions and averages, which are not really true in individual cases. This subject was a very appropriate one for the consideration of Section F.; but there were others which were less so, and we must take leave to offer a caution against permitting it to become, as it were, a common sink into which all subjects and papers excluded or rejected by other Sections are to be thrown.

MECHANICAL SCIENCE. (SECTION G.)

IN opening the proceedings of the Section, the President, Mr. C. W. Merrifield, F.R.S., delivered an address, in which he briefly reviewed what to his mind were the defects in the system of instruction generally adopted for the teaching of natural and especially mechanical science, to which he added some observations on points connected with the crowding of the population and its consequences in connexion with mechanical science. While he desired not to speak slightly of historical or literary studies, for he held them in high estimation, still he could not but feel that too great a predominance was given to them in our secondary school teaching over instruction in science. Viewed by the light of modern necessities, the man who is not fairly versed in exact science is only a half-educated man, and if he has substituted literature and history for it he has chosen the less useful alternative. The undue preference given to literary over natural knowledge, and in particular the sacrifice of mathematical to classical study, in the secondary school he considered a serious obstacle to the spread of science, and to our national prosperity. One chief fault he noticed was the teaching of algebra too late and the teaching of Euclid too early. He regarded abstract geometry as a foolish study, unless accompanied by linear drawing, too often neglected. Euclid he did not consider the best possible text-book

for teaching geometry. Even in the teaching of Greek and Latin, he thought too much attention was given them as exercises of grammar, and too little as languages. He hoped in Scotland things were better managed; in England it is the rule to spend from six to eight years in learning Latin and Greek, and it is the exception for the scholar to be able to read either. He considered that a knowledge of algebra was a great help to the learning of chemistry, electricity, and such like sciences, inasmuch as so large a portion of the books on these subjects nowadays was filled with formulae of an algebraic character. He, however, was glad to own that mathematical study was extending. He then proceeded to touch upon overcrowding in our cities, and among the difficulties of town life he reckoned: 1, the insufficient supply of fresh air, whether from overcrowding in our houses, or from narrowness or unwholesomeness of the streets; 2, the mere proximity of individuals facilitating the spread of contagious or infectious diseases; 3, the getting rid of excreta or waste products; and 4, a wholesome water supply to be provided and kept pure. So far as the first is concerned, much of it falls rather within the province of Section F, though it is the duty of the engineer to palliate the evils of overcrowding by supplying the means of ventilation and cleanliness. The copious watering of our streets, unaccompanied by due means for careful scavenging, to his mind combined all the conditions for carrying on unhealthy putrefactive processes on an extensive scale. As regards No. 2, though within the province of the engineer in a broad view, he considered the details belonged to Section D. With regard to No. 3, he considered it as affording a remarkable example of the great danger of all improvements, namely, their unintelligent use. The water-closet and the sewer are great mechanical improvements, yet they have been great carriers of disease, and he considered they had done more in saving trouble than in conducting to health. As regarded a constant water-supply for the metropolis, he had considerable misgiving lest it should not be applied with intelligence. He foresaw two serious dangers, one of sewage contamination through the water-closets, the other, waste of an article already becoming scarce. He would be sorry to see a constant supply in London without some effectual security, either by the interposition of cisterns or otherwise, to prevent the possibility of back drafts from the cess to the drinking water. Our supply of water from a large variety of sources hitherto pure is diminishing, owing to improvements in agriculture and the over-taxation of the filtering power of the soil. He advocated the separation of the supply for drinking from that for other purposes, and suggested that distillation might be found applicable to the supply of the first. The management of all this supply should, with that of the roads, lighting, and drainage, be concentrated into one hand, or board, for each town or district. The evils arising from the want of this in London were matter for serious consideration. Besides this, there is a want of a knowledge of natural science in our local governing bodies, and this is but ill supplied by the employment of professional officers. More of it is wanted for the governing bodies themselves before their technical advisers can be properly appreciated or controlled.

Papers were then read by Mr. J. Deas, 'On Stobcross Docks,' and by Mr. T. S. Hunter, 'On Dock and Quay Walls.' These papers were largely illustrated with drawings of the details of their construction, but were of too technical a character to be of interest to any but the professional reader. —Prof. James Thomson then brought before the Section a short paper, by Mr. J. Sang, describing an apparatus for cleaning and filtering sand. The principle on which the apparatus worked was that of the flow of water being forced upwards through the material to be cleansed. —The proceedings for the day were closed by a highly interesting paper, by Mr. W. D. Scott-Moncrieff, descriptive of his "Pneumatic Tramway Car." The motive power propelling the car is compressed air; the merit of

the invention consists in the details and arrangements by which this power is made available, and it is obvious that these cannot be made intelligible without reference to numerous descriptive figures and drawings, and even then they would be more fit for the pages of a technical journal than of one intended for the general reader. Suffice it to say that Mr. Scott-Moncrieff appears to have overcome most, if not all, of the difficulties of the problem, and to have turned out a practical working engine and car combined, suitable for street traffic. The time would seem to be fast approaching when horse-power for these purposes will be superseded, whether by steam, compressed air, or springs, or, perhaps, by all three. Already a steam tramway car, the invention of the late Mr. John Grantham, and for which the Society of Arts gave its gold medal a year since, is in actual work at Wantage, a compact steam locomotive is drawing cars on the Brussels tramways, and Mr. Scott-Moncrieff's compressed air tram-car was shown to members of the Section, in actual working in the Glasgow streets.

The proceedings on Friday were commenced by the reading of three Reports of Committees. The Report of the Committee on "Instruments for Measuring the Speed of Ships," signed by Messrs. Froude and C. W. Siemens, was simply of an interim character, and recommended the continuation of the investigation and a reappointment of the Committee for this purpose, with a grant of 50*l*. The Committee on the "Use of Steel for Structural Purposes," which had been originally appointed on the suggestion of Mr. W. Barlow, when president of this Section two or three years back, reported that, after a considerable amount of correspondence with the Board of Trade, with a view of arriving at the conditions on which that department of the Government would sanction the use of steel in engineering constructions coming under their cognizance, Col. Yolland, Sir John Hawkshaw, and Mr. W. Barlow had been appointed by the Board to endeavour to arrange these conditions. The Committee were glad to find that the matter was now in a fair way for settlement, and they hoped, at the next meeting, to announce that a satisfactory conclusion had been arrived at. —Mr. G. J. Symons then read the Report of the Rainfall Committee, which, in accordance with the views put forth at the last meeting of the Association, it was understood would not be reappointed, it being considered that the Committee had thoroughly fulfilled its functions, by the establishment of a complete system of observation all over the country and publication of the results, and that it was now the duty either of the Government or the profession so largely benefited by their labours, to continue the system in action. At the request of Mr. Bramwell, Mr. Symons gave a brief and lucid account of work done by the Committee, and it was thereupon resolved unanimously by the Section to recommend that, in some form or other, the labours of this Committee should not cease as contemplated last year. It was admitted that there were considerable difficulties, at all events for the present, in the work being undertaken by the Government, and that, as regards the cost being defrayed by the profession, it would not be just to call upon them, inasmuch as the information collected was in reality of great public utility. —'Hydro-geological Surveys' formed the theme of a paper by Mr. Baldwin Latham. The author pointed out the evils, in a sanitary point of view, arising from want of proper and careful attention to the conditions of the underground water flow. Sources of water supply were frequently fixed upon without sufficient reference to their conditions, and disease necessarily ensued. Wells and cesspools were frequently so placed that, though apparently situated so as not to be in connexion, yet in reality the flow from the cesspool contaminated the well. He showed, from sections taken by him in actual practice, that an inference as to the flow of the underground water from the levels of the surface ground was fallacious, and if that alone had been depended upon, evil conse-

quences to health must have followed. Before constructing a well, it was necessary to ascertain the direction in which the water is moving, and so to place it that it cannot be contaminated by the cesspool. In towns the number of points of pollution are so numerous that no well can be considered safe.

A paper was read by Mr. J. B. Fell 'On the Experiments made at the Camp at Aldershot with a new form of Military Field Railway for rapid construction in time of War.' Mr. Fell observed that field railways were now recognized as being amongst the most important appliances in modern warfare, but hitherto it had been found impossible to construct them with such rapidity as to be available for the transport service at the commencement of a war. Our Government, therefore, had under consideration the practicability of adopting some other method of construction by which the difficulties hitherto experienced might be overcome. For that object the Royal Engineer Committee at Chatham had carried out a series of experiments at the camp at Aldershot, of which Capt. Luard, R.E., and the author had charge. The experimental line was one mile in length, the gauge 18 inches, the steepest gradient 1 in 50, the sharpest curve 3 chains radius, and the greatest height above the ground was 24 feet. The locomotive engine and waggons were made with a low centre of gravity, and furnished with horizontal wheels so placed as to run upon guide rails fixed on the lower edge of the beams of the structure, by which the necessary lateral stability and steadiness in the running of the trains upon so narrow a gauge were secured. The locomotive engine weighed 4½ tons, and the tender 2½ tons; the waggons, 10 in number, were 10 feet long and 5½ feet wide. The trials were made in two series, the object of the first being to test the carrying capabilities of the railway, and that of the second, to prove with what degree of rapidity it could be constructed in war time. The programme or conditions proposed to be fulfilled in the trials were—1st. That the waggons should carry 3 tons of dead weight each, and also bulky articles, and two waggons should carry one 7-ton siege gun; that an engine weighing 6 tons should draw a train of 30 tons up an incline of 1 in 50, and run at an average speed of 10 miles, and maximum of 20 miles, per hour. 2nd. That the railway should be constructed at the rate of one mile per day, with the labour of 500 men, such rate of progress being ten times what had hitherto been accomplished upon the ordinary system. The result of the trials of the working of the railway during eight months was that all the above-named conditions were fulfilled to the satisfaction of the Royal Engineer Committee. It may be well to mention that a railway on the same principle, but only 8 inches gauge, had been working satisfactorily for three years as a branch to the Furness Railway in North Lancashire. It had carried 26,000 tons of minerals per annum, and at times over 300 tons per day. For the above-named period the cost of the maintenance and repairs of the structure has been nil. It was found that a gang of men could construct at the rate of 300 yards of field railway of the above construction per day, and six gangs, or 180 men, could construct one mile of railway in one day. Consequently more than two miles of field railway could be made with the labour of 500 men, which is double the rate of construction required by the programme, and twenty times the length that could be made of ordinary railway by the labour of the same number of men. These trials were made by companies of Sappers, and were continued at intervals for about three months, when the Royal Engineer Committee came to the conclusion that the conditions of the programme had in every respect been carried out and exceeded. The rapidity with which a field railway can be made depends much upon the character of the country, but the ground at Aldershot was, if anything, more difficult than that at Metz, or in Abyssinia. The railway in Abyssinia would have been made in a fortnight, in place of four months; and, with the number of men employed by the Germans, the twenty miles of military rail-

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way made in the Franco-German war could have been completed in three or four days, instead of the forty-five days which were actually occupied in its construction. When there is again occasion to send out an expeditionary force from this country, a single transport would carry along with it materials and rolling stock sufficient for laying down twelve or fifteen miles of railway for use at the commencement of the campaign.

Mr. W. J. Millar read a paper, the object of which was to describe results obtained in testing cast-iron bars, thirty-six inch span, two inches deep, and one inch broad. The bars usually broke with straight fractures, but curved fractures were occasionally observed. The principal object of the paper was to show the relation existing between form and position of fracture,—straight fractures taking place at, or close to, the centre of span, curved fractures occurring at points more or less removed from the centre of span.

A paper was then read by Mr. J. H. Greenhill on an improved grain-sieve, which he had constructed, for the purpose of obviating one of the difficulties with which millers and distillers have to contend, namely, the separation of nails, pieces of metal, and other similar foreign matter from the grain before it is ground.

Mr. William Coleman read a paper on the mechanical details of his gas condensing-engine, described in the Chemical Section on the previous day. These are of too complicated character to be explained without reference to diagrams, and would not be of interest to the general reader.

BRITISH ASSOCIATION NOTES.

DR. ALLEN THOMSON, Professor of Anatomy in the University of Glasgow, has been nominated President-elect of the British Association. The next meeting will be held at Plymouth in August, 1877. Considerable discussion arose in the General Committee as to the selection of the place of meeting for the following year, and the rival claims of Leeds and Dublin were carefully weighed. The decision was in favour of Dublin, mainly through the effect of a powerful speech by Prof. Houghton.

Dr. P. L. Sclater, of the Zoological Society, has been elected one of the General Secretaries of the Association, in the place of Dr. Michael Foster, who has retired.

At the meeting of the General Committee on Wednesday last, it was determined to so arrange the commencement of the sectional meetings in future that the presidential addresses should not be delivered simultaneously in the several Sections. The effect of this regulation will be to give members an opportunity of hearing more than one of these addresses.

Prof. A. Newton, of Cambridge, occupied the chair at the meeting of the "Red Lions" on Monday evening. The humorous speeches and comic songs were in the usual strain; but the feature of the evening seemed to be the sending of fictitious telegrams to the chairman from eminent men in all parts of the world. Some of these, such as those from Profs. Huxley and Tyndall, were extremely amusing.

About the last thing the Glasgow people did by way of showing respect to the Association was to have a photograph taken of the members of the General Committee in one large group.

The following foreigners were present at the Glasgow meeting:—M. Ch. Bergeron, of Paris; Dr. E. Biedermann, of Berlin; Dr. F. Cohn, of Breslau; Prof. L. Cremona, of Rome; Prof. Escher, of Florence; Dr. A. Fritsch, of Prague; Dr. E. Grube, of Breslau; Prof. E. Haeckel, of Jena; Prof. von Quintus Icilius, of Hanover; Dr. W. J. Janssen, of Leyden; Dr. G. Jung, of Milan; Dr. A. von Lasaulx, of Breslau; Chevalier Negri, President of the Italian Geographical Society; Dr. F. Roemer, of Breslau; and M. Wüllner, of Aix-la-Chapelle.

MEETING FOR THE ENSUING WEEK.
Friday.—Quekett Microscopical, 8.

Science Gossip.

MESSRS. MACMILLAN & Co. have in the press a Text-Book of Physiology, for medical students and others, by Dr. Michael Foster, F.R.S., which will be published early in November.

MESSRS. SAMPSON LOW & Co. have in the press a popular account of the Cruise of H.M.S. Challenger, from the pen of Mr. W. Spry, R.N., one of the members of the Expedition. The work will be illustrated.

THE *Companion to the British Almanac* for 1877 will contain an article on 'Planetary Research and Discovery,' from the pen of Mr. Lynn, of the Greenwich Observatory.

THE Report of the Meteorological Committee of the Royal Society for 1875 has just been published. The Report shows that considerable attention has been paid to ocean meteorology; that the arrangements for weather telegraphy are now fairly complete, and that the land meteorology of the British Islands continues in operation without material change.

THE meeting at Leeds of the Iron and Steel Institute will take place on the 18th, 19th, 20th, 21st, and 22nd of this month. On the first day, the Monday, a meeting of General Council, and the formal General Meeting for election of Members, &c., will be held. On the Tuesday morning will follow a General Meeting in the Civil Court, Town Hall, when the Mayor of Leeds will attend and open the proceedings. A selection of papers will be read and discussed. During the afternoon those members of the Institute who do not wish to attend the British Iron Trade Conference will be able to visit various works. On Wednesday morning there will be a General Meeting in the Civil Court, Town Hall, for the reading of papers; in the afternoon some other works in the neighbourhood of Leeds will be visited. Thursday morning will also be devoted to the reading and discussion of papers. In the afternoon the members will proceed by special train to visit the Bowling and Lowmoor Iron Works. The Firebrick and Sanitary Tube Works of Messrs. Joseph Cliff & Son, and W. Ingham & Sons, at Wortley, may also be visited. Friday, September 22nd, will be devoted to excursions.

DR. R. WOLF, of the Observatory of Zurich, has written to M. Le Verrier that M. Weber saw at Peckeloh, on the 4th of April at 4h. 25m. Berlin mean time, a round spot on the sun, although the sun had been seen without spot, both on the preceding and following mornings, by M. Weber himself, by Dr. Wolf, and by Dr. Schmidt at Athens. Dr. Wolf calls attention in the letter to the fact that this observation was made 6,219 days after the supposed observation of the so-called Vulcan by M. Lescaubault at Orgères, and that this interval is a multiple (148 times) of 42.02 days, which he, Dr. Wolf, had considered to be the time of revolution of Vulcan. For our part, we must still consider the existence of Vulcan as apocryphal, remembering the strong negative evidence of M. Liass, and the vigorous and unsuccessful search made for the planet soon after its supposed discovery. But of course this does not invalidate the possibility of a subsequent discovery of a planet within the orbit of Mercury.

It is worthy of note that in the laboratory of the French School of Mines, founded, in 1845, for analyzing gratuitously any substances submitted, made last year 767 analyses, chiefly minerals and manures. Since the commencement, 23,571 analyses have been made in this laboratory free of any charge.

FINE ARTS

DORÉ'S TWO GREAT WORKS, 'CHRIST LEAVING THE PRETORIUM,' and 'CHRIST ENTERING THE TEMPLE' (the latter just completed), each 31 by 22 feet, with 'Dream of Pilate's Wife,' 'Christian Martyrs,' 'Night of the Crucifixion,' 'House of Caiaphas,' &c., at the DORÉ GALLERY, 35, New Bond Street. Daily, Ten to Six.—1s.

THE PRIVATE COLLECTIONS OF ENGLAND. No. XXV.—CASTLE HOWARD.

A CONSIDERABLE privilege was granted when we were allowed to study in the gallery and rooms of Vanbrugh's stately and by no means ungraceful building the pictures and other works gathered by amateurs, and especially by Frederick, fifth Earl of Carlisle, who acquired a large proportion of the Italian paintings of the Orleans Gallery, brought to this country in 1792. Our readers remember that when the Duke of Orleans sold his pictures, in order to procure means for his own ends during the approaching storms of the French Revolution, the Italian and French paintings were bought by M. Walkuers, a banker of Brussels, for 750,000 livres (18,500*l.*). He sold them again to M. Laborde de Mereville, a Frenchman of fortune, for 900,000 francs. They are said, however, by some authorities to have been lost at billiards by the Duke to M. Laborde de Mereville, who desired, so says Buchanan, to retain these treasures in France, and began to build a gallery for them in the Rue d'Artois. The Revolution broke out before this could be accomplished, and M. Laborde de Mereville took refuge in England, and contrived to transport his pictures thither. These, which had been mortgaged for 40,000*l.* to Mr. Harman, the banker, were bought from M. de Mereville's representatives by Mr. Bryan, a famous dealer of those days, to whom we owe so much of "Stanley's Bryan," on the part of the Duke of Bridgewater, who shared the purchase with the Earl of Carlisle and Earl Gower, afterwards Marquis of Stafford. The price paid for the whole of these Italian and French paintings was 43,000*l.* The buyers selected from the mass those examples which suited them severally. Castle Howard contains the Earl of Carlisle's portion, the Bridgewater Gallery those, ninety-four in all, which, valued at 39,000 guineas, were chosen by the Duke; the Sutherland or Stafford House Gallery contains the rest of these selected pictures. Earl Gower had a fourth of the collection, the Earl of Carlisle an eighth part, the number of the whole being four hundred and five. Each of the galleries above named contains numerous treasures acquired before and since the Orleans Collection was thus divided. After these selections were made, the remainder of the pictures was exhibited for sale at Bryan's rooms in Pall Mall, and at the Lyceum Theatre, for six months, from December 26, 1798. After the exhibition, the purchased works were delivered to their owners, the whole sum thus realized being 31,000 guineas. The remainder was sold by Cox, the auctioneer, and, with the receipts of the Exhibition, realized 10,000*l.* more. It is from these respective classes of buyers that the numerous Italian paintings now dispersed throughout England, and referred to the Orleans Gallery, should be traceable. The purchase of the Orleans Gallery was, under these circumstances, so far fortunate that the Duke's share was obtained for 2,000*l.*, and among them are superb masterpieces.

The Flemish, Dutch, and German pictures of the Orleans Gallery have a different history. The Earl of Carlisle bought some of these examples at the sale of 1792, which comprised works of the schools in question. The purchases of Earl Frederick, and those which have been since and were before made, resulted in the formation of one of the most select private collections in England, or, indeed, in Europe. The gallery at Castle Howard in this respect holds among private collections the position held by the National Gallery among public ones, and, like the latter, it is by no means a minor one as regards numbers. It is remarkable for several distinct features, due to the concurrence of elements of rare intrinsic value, *e.g.*, a considerable number of early French portraits, in chalk and oil, a noble Giovanni Bellini, of the best and most characteristic period of the artist's practice, from the Orleans Gallery; two superb portraits by Tintoret, two magnificent landscapes by the same artist, of the highest poetical value, and gloriously painted, and two more by him, hardly inferior to these wonders;

the great Mabuse, 'The Adoration of the Kings,' which has not been before the public since 1851, when it was at the British Institution; a delicious study of a 'St. John,' by Correggio; Van Dyck's portrait of Snyder, to which we recently referred; a charming Van Goyen; Reynolds's 'Omai'; the famous Rubens, 'Thomas Howard, Earl of Arundel'; A. Carracci's celebrated 'Christ at the Foot of the Cross,' commonly called the 'Three Marys'; a superb Velasquez, portrait of a half-negro half-white man, and portraits of Philip the Second, and others, by Titian; two female heads by Giorgione; a highly interesting life-size portrait of Mrs. Graham, by Gainsborough, representing, with hardly inferior charm, the lady whose piquante beauty has attracted us all in Gainsborough's record, now in the Edinburgh National Gallery. In addition, Castle Howard contains a large collection of lovely miniatures, numerous antiques, sculptures, and inscriptions, objects of art on which we can pretend to offer only notes made during a general survey.

We confess it is difficult to become enthusiastic over the exterior of Castle Howard, but on entering the building the visitor is attracted by the graceful picturesqueness of the architecture, its lightness, and "freedom," if the term be permitted to express the absence of conventions employed for their own sakes; such a quality is seldom wanting in Vanbrugh's buildings, but it is best seen at this house, which surpasses the too-much-abused Blenheim in all respects but size. The pictures are used to decorate the state rooms, and, generally speaking, are well displayed in the light supplied by ample windows. It is true that some of the less important examples are hardly visible, but this is the case everywhere, except in galleries specially constructed for showing pictures, and even the latter are not always perfectly adapted to the purpose. In houses where picture galleries serve as corridors, the result is that which is usual in compromises—failure in both respects. The owner is cursed with an ill-placed corridor and a bad gallery. The practice of hanging pictures in rooms inhabited by the owners who are so generous as to allow others to see their treasures, as at Chatsworth and Castle Howard, must produce considerable personal inconvenience, but, on the other hand, to make up for the loss of privacy this practice secures the noblest, most inspiring, most poetic companionship in the silent masterpieces on the walls.

Old French School.

After glancing at Pellegrini's clever decorations on the side and cupola of the hall, vestibules, and staircases, and recognizing nothing better than vivacious and skilful enrichments, of no mental value, interesting only to the mere eye of the passenger, we catch sight of a finely proportioned little room and its approaches, both lined with framed drawings of heads of noblemen and ladies, all evidently of the French Court, and living during the period of Henry the Second, Francis the Second, Charles the Ninth, and Henry the Third. Our interest in the humanity of these personages is at once roused; a careful, if not an exhaustive, examination of these apparently dry and unattractive examples is full of interest, for the charm they exercise on the man who brings knowledge and human sympathy to the study is profound and fascinating. He will make a mistake who passes them in haste, although their number is formidable; and although, of the 314 drawings, a considerable proportion are in folios and not readily accessible, it is certain that the large number hanging on the walls supply ample material for ordinary visitors. We found their attractions practically inexhaustible, as, indeed, at any time, are those of a large portrait gallery, but the effect is intensified in this case by the fact that we have at one view a complete representation of the men and women of one generation, of the most splendid court in Europe, including not a few whose renown for good and evil still rings in our ears. Wit, wisdom, beauty, valour, craft, folly, weakness, lust, pride, and wrath are here, in man after man, and

woman after woman, in long lines of half life-size busts. The faces are nearly all in three-quarters view, lightly and skilfully drawn in red and black chalks on paper, which is now, if it was not originally, of a slightly buffish hue, all the faces being drawn with a certain manner and uniformity which proves that the artist was not a first-rate man. Yet he was endowed with insight into the marvellous diversity of the faces of those who must have come before him, one after the other, lord and lady, knight and priest, king and queen, prince and princess, in a long procession, which has closed in the darkness of 300 years ago, and was contemporary with the House of Angoulême almost from its rise to its fall.

The names of the sitters—and the correctness of at least the majority of the names there is no reason to doubt—are inscribed on each drawing with a pen, in a late sixteenth century, half-Gothic hand, and in ink that has faded. The very titles and quaint suggestive allusions which accompany them have power over the memory, and stir the fancy. The whole series of drawings is executed with great delicacy and tact, rather than with the consummate skill of Holbein, to whom writers have not hesitated to ascribe drawings of the same class as these. Their style is small, i.e., deficient in freedom, but the greater number of the examples are rather highly and carefully, if not learnedly, finished—the skill employed is, in fact, more searching than mastery. They lack the marvellous precision, the amazing insight and subtlety of Holbein, who with unerring skill drew eyes and lips as no one but Da Vinci has drawn them before or since the Bâle painter's time. They are less solid, less refined, less subtle as readings of character, altogether of a less masculine and whole kind, and are marked by no such penetration into the soul of the sitter as is distinctly shown in the works of Holbein. Of the superficial elements of portraiture there is no lack in the Castle Howard drawings, nor of feature-interpretation and formal characterization; of these they exhibit enough and to spare. But for all this, there is hardly a sign that the artist saw what may be seen in the eyes of any man or woman—the mind and soul.

First, we noticed 'The Old Queen of Navarre,' with a dog (Marguerite de Valois); there is another like this in the Stafford House collection of similar drawings; the 'Madlle. de Vendosme Laisnée,' a young lady, very lively with aspect and air, comes next, then follow 'Mad^{me} l'amiral de Briom'; 'Madame destampes fills,' a shrewd, merry-looking woman; 'Le chevalier d'ambre'; 'Pio du fou,' with handsome, intelligent, somewhat peevish face; 'Viconte breze'; 'La Roynne Madellaine descose,' as a baby, with beautiful, rather imperious features, haughty eyes and firm lips; 'La Princeesse de montignan,' a wizened, but cheery, old maidish-looking damsel, of a very certain age; 'Charles maximilian, duc d'orleans,' of two years old, a flabby infant, with a bat in his hand; 'Amdelot,' a soldierly gentleman; 'l'amiral,' with a sagacious and earnest look; 'Mon^{seigneur} d'angouise filz du roi francois,' who is the "picture" of his father; 'Mon^{seigneur} des ferant,' apparently with but one eye, his cap carefully made to droop over the other eye; 'Marie roynne descose,' at nine years and six months old, a bright and intelligent face, the delicate features of which do not promise the beauty which became so celebrated, beauty which must have been due to regularity of surface, and to her expression. 'Le Roy henry de navarre,' a cautious, rather unchaste-looking personage, with very keen eyes, close shaven, and close cropped; 'La Roynne Jehanne de navarre,' a beautiful dame with a lewd look, great shrewdness, and intelligence. Then comes to view the half-frightened little boy, 'Le Roy francois second'; then 'Mon^{seigneur} le Conestable,' with a grey, well-combed beard; 'Le Conte de merne filz aîné du Roi de navarre,' a half-swathed baby, with a face like a young bull; 'The Dauphin Francis,' 'huict ans cinq mois au mois de Juilliet lan 1552,' has a face not without beauty and spirit, but a little fretful in its character, as if troubled in late teething; 'Le Sr de lanoue' was a debauchee, unless,

indeed, his looks belied him; 'Mad^{me} Elizabeth Roynne despaigne 14 ans,' a bright face, with frizzled hair and negress look, professes to give the face of Henry the Second's daughter, affianced to our Edward the Fourth and afterwards to Don Carlos, but married to Philip the Second, the father of the latter, in 1559, and died 1568, a partner in a tragic history. 'l'infante de portugal fille de la roynne lenore' has her hair, in the old Spanish fashion, under a coif with pearls. Her mother, likewise here, is a long-faced, small-eyed, thick-lipped woman, wearing the coif which was introduced by "Margot." 'Mad^{me} la Marechalle de Brene' is a simple-minded old lady, in a widow's hood; 'Le Marechal de Brisac' is an astute soldier; 'Monchenu' is the very type of a court waiting-maid, whoever she may have been. We might readily fill our space with names and notes, and enlarge abundantly on the lives and acts of no small number of the personages thus brought to view; but enough has been said to show the general characteristics of this remarkable and highly interesting collection of drawings. In this respect the whole may be matched with the gatherings at Stafford House and in the Louvre. The works before us seem to be in keeping with the vivid individuality of Vite's dramas and Brantôme's records. Although it may be said that the greater number are, as Dr. Waagen asserted they were, by the same hand, this would not be true of all; it is possible to detect at least three artists' labours in the mass. Drawings undoubtedly belonging to the same category, and by the same draughtsman, are in several collections mentioned above; others are in the British Museum, Department of Prints and Drawings. The questions, who executed them, and why they were made, are not easy to decide. One can hardly presume that one man painted so many portraits in the laboured manner these examples indicate. It seems, therefore, that, especially as comparatively few pictures have been traced as due to them, and one dare not presume any very large number of such pictures have been lost, the draughtsman, in obedience to a fashion or some particular demand, made these studies of his contemporaries' faces, and painted some of them at later dates from the drawings. The analogous collection of drawings in the Royal Collection at Windsor, by Holbein, will occur to the memory of the reader; of these, however, the larger number reappear in known pictures, and are easily identifiable. That the pictures at Howard Castle are the work of a member of the French School, that of Clouet III., cannot be doubted; but even the authorities of the Louvre, possessing exceptional opportunities and acknowledged acumen, refuse to the perfectly similar drawings in their charge (e.g., Nos. 1350, 1354, 1359, 1360 to 1364, and 1370) the name of Clouet. They cautiously class them with the École Française in general, and decline to award them to Clouet III. It is impossible to receive these drawings as the work of Clouet III., without rejecting all the rest of the evidence we possess about the style and the value of his practice, as shown in the pictures of Charles the Ninth (No. 107), and of the wife of this monarch, Elizabeth of Austria (No. 108), both in the Salon Carré of the Louvre. Still less can we accept the head of an old man, Dessins, No. 682, as by the hand which produced the entirely different drawings at Castle Howard and elsewhere, attributed to him.

The whole, or, at least, the greater part, of the drawings of this category, whether they are now at the Louvre, the British Museum, or Stafford House, are associated with the name of M. Alexandre Lenoir, who was honourably concerned in rescuing French antiquities and works of art during the Revolution, when he set up the Musée des Monuments Français, as it was afterwards styled, in the Petits Augustins, now the Ecole des Beaux Arts, as a place for receiving the treasures he contrived to preserve, including tombs from St. Denis and elsewhere, architectural fragments, and the like. Lenoir had charge of this Musée for a long time, until 1816, when, no one seemed to know why,

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the collection was dispersed, and its curator's office abolished. Lenoir was afterwards appointed, says Mrs. Jameson, in her account of him, Curator of the Royal Monuments in St. Denis. He died in 1839, having sold his collection of portraits—at least, a considerable portion of them—to the Duke of Sutherland. It is noteworthy that drawings of the same person, evidently by the same hand, and similar, if not exactly alike, are at Castle Howard and Stafford House, and that the number of drawings by this hand now in the four collections we have named is considerable, approaching 300, or 250, at least. Lord Ronald Gower has recently published volumes containing copies, in auto-lithography from his own sketches, of most of the drawings at Castle Howard, as well as of those in Stafford House. These copies we reviewed when they were issued.

There are other examples here, undoubtedly of the French school, and by Clouet III., i.e., François Clouet. The portraits of 'The Family of Henry the Second of France' is the most important of the artist's works remaining, much larger and more elaborate than the pictures in the Louvre respectively. It comprises four life-sized figures, whole-length, of Catherine de Médicis and her children, afterwards Francis the Second, Charles the Ninth, Henry the Third, and the Princess Margaret. The faces are pale, in the manner of the painter, who seems to have affected a somewhat olive undertone, at least his pictures now exhibit that quality. The red hues may have faded, but the flesh here is stronger in the red than is commonly observable in Clouet's pictures,—for instance, those we have mentioned, the portrait of Charles the Ninth, in the Louvre (107), and that of Elizabeth of Austria (108), both of which were part of the French Royal Collection. Of the former there is a life-sized version, ascribed to Clouet III., at Vienna. The former two are types of the artist's manner of looking at his subjects and of his peculiar mode of painting, and they agree exactly with the much more important example at Castle Howard. The colour of the latter is very agreeable in its harmony, owing to the predominance of a citron-like hue, or bronze of pale tint, in unison with greyish-blue. The design of the group is feeble, for all the figures look straight at the spectator, but an attempt at composing the figures and bringing the attitudes to a graceful ordinance is distinct enough. The faces are admirable searching pieces of characterization, within the limits characteristic of the school of Clouet. But the legs, and of course there are a good many of them in these life-size standing figures, are very queerly drawn and weakly modelled. These defective elements of his work seem to indicate that the painter had relatively little practice with whole-length figures: his efforts herein displayed approach grotesqueness; the definition of individual character in so many faces, having a family likeness withal, is so fortunate that this unlovely family of Angoulême seems to live before us, with their lean forms, their ungainly legs, their pale olive skins. Catherine's coarser features and cat-like aspect are of quite a different strain from that apparent in her children. Henry the Third contrasts strongly, as might be expected, with Charles the Ninth. The hands, as is invariably the case in pictures of all schools when in the stage indicated by this example, were executed with admirable and exhaustive care. At Hampton Court is a charming portrait ascribed to Clouet IV., and said to represent Francis the Second as a boy. The Earl of Carlisle's picture was formerly at Strawberry Hill, and sold on the twenty-first day of the dispersion of Walpole's treasures, lot 89; it had previously been in the collection of "Mr. Byde, in Hertfordshire," so says the sale catalogue.

To group here the remaining pictures of the French School at Castle Howard, we shall pass to Le Nain's 'View of a Village Street,' comprising figures of peasants: a lad seated on the ground, holding a cock. As a painting this is rather cold

and artificial, but it is a good Le Nain, and may be compared with that at Stafford House.—There is a not first-rate Watteau, 'The Lady's Fountain': a youth in green, a lady in pink, with other figures.

MR. WILLIAM SMITH.

By the death of this distinguished art-antiquary the public are great losers. Famous throughout Europe for his knowledge of engravings, and above all for profound learning with regard to portraits, Mr. Smith devoted all the leisure of his later life to the service of those whose pursuits were like his own. Few men could approach him in extent and accuracy of knowledge: none rivalled the liberality with which he imparted what, during a long and busy life, he had learned. In England, France, Germany, and Holland, his name is widely known as a collector of prints and drawings; and his learning made him one of the best judges of a print on record. Conscientious, earnest, indefatigable, he took a large share in the formation of the National Portrait Gallery, of which he was for many years Deputy-Chairman. He devoted much attention to the affairs of the Art Union of London, and was an active Fellow of the Society of Antiquaries. He energetically promoted many plans for improving the art-education of the people, and may be said to have been an unofficial adviser to more than one of the greater national collections of works of art, and to not a few of the more eminent owners of pictures, drawings, and prints.

Born in Lisle Street, Leicester Square, July 11, 1808, where his father had been for many years a printseller, he succeeded, in 1835, to the business, which was of the most extensive and choice kind, and continued it, in conjunction with his surviving brother, Mr. George Smith. He bought the whole of Mr. Sheepshanks's famous collection of prints, the Low Country portions of which he sold to the British Museum for 5,000*l.*, although much larger offers were made to him from Holland. The Print Room, indeed, owes to his zeal, learning, and patriotism the acquisition of many valuable and beautiful works, gathered here and abroad, especially early Italian and German engravings from some of the most important collections. One of the results of these transactions was to make the Print Room eminent above nearly all similar gatherings. The Brothers Smith, "of Lisle Street," retired from business thirty years ago, with large fortunes, realized in the most honourable manner.

From that time Mr. Smith's labours were wholly honorary and patriotic, and acknowledged as such by all whom he delighted to serve. Our pages have frequently profited by his liberality in imparting information; and every student who needed his aid had it in the fullest measure. Besides the national institutions we have named as profiting so largely by his aid, those less distinctly public, but hardly less serviceable, schemes for the promotion of art, the International Exhibition, 1862, the Chronological Exhibition of Water-colour Drawings, from which so much of our exact knowledge of the art may be said to be derived, and several similar efforts in the same direction, benefited largely by his assistance. Nor were these services the greatest for which England is indebted to him. It had been one of his principal occupations to form a complete representative gathering, an exhaustive chronological series, of English water-colour paintings, the works being intended to represent the peculiar styles and modes of every artist this country has produced. By unremitting care, and the exercise of extraordinary learning and good taste, by dint of enormous labour, and the expenditure of a considerable sum of money, Mr. Smith succeeded in obtaining exactly what he desired—a gathering comprising many hundreds of fine works. These he had declared his intention of bequeathing to the South Kensington Museum; but, anticipating this purpose, he most liberally allowed the authorities to forestall his bequest, and select what they pleased from the whole. This generous deed has

now for some time past added greatly to the usefulness and the attractions of the museum. All too soon, however, the gift will now in its entirety fall to the nation.

Returning from the funeral of a friend on the 6th inst., Mr. Smith was attacked by apoplexy, which immediately proved fatal. He was buried at Kensal Green, where so many art-lovers lie, on Wednesday last, and attended to the grave by as many of his large circle of friends as the season, and the suddenness of his death, allowed to assemble and pay the last honours to one of the most amiable and zealous of students.

Fine-Art Gossip.

WE are glad to hear that M. Rajon has recovered from the effects of the accident which happened to him while riding in Paris a few weeks since.

MR. R. E. PEACH writes:—"In your description of the Raby Collection you speak of Barker's 'Woodman' as the version which was reproduced on china, pottery, &c. I think this is not so. The version which was so reproduced, and which was engraved by Bartolozzi, is now, I believe, in the South Kensington Museum. The version at Raby was purchased by Lord W. Powlett, and was kept by him at his residence in Curzon Street, until he succeeded to the dukedom in 1859, when he added the picture to the Raby Collection. The version now in South Kensington Museum (if I am not mistaken) is that which formerly belonged to Boydell, and was the earlier version produced by Barker. Boydell gave seven hundred guineas for it."

A LAMENTABLE accident has deprived the Society of Painters in Water Colours of one of its popular members. Mr. J. Whittaker was found drowned near Bettws-y-Coed, on Saturday morning last. The artist was a frequent contributor to the Exhibitions of the Society, and was elected an Associate of the body in 1861, a Member in 1864. Though often choosing continental subjects for his skill, Welsh scenery was mostly affected by him; he lived at Llanwrst, and was well known in the valleys of the Conway, Machno, and Llugwy.

M. ADOLF TIDEMAND, the Norwegian painter of genre and pathetic subjects, died on the 25th of last month. He was born August 14, 1816, at Mandal, in Norway; educated at Copenhagen and Düsseldorf, in the school of Mr. Hildebrandt. He obtained a first-class medal in Paris, 1855, and was made a knight of the Legion of Honour in the same year. Many of this artist's pictures are in England. For instance, his 'Beneficence' belongs to the Duke of Hamilton; 'Funeral Procession on the Sognefjord' is in the possession of the Marquis of Lansdowne; 'Norwegian Peasants playing Cards' is in the hands of Mr. J. Mathieson. Two of his important works will be fresh in the memory of visitors to the International Exhibition, 1862, being 'Haugians,' a religious sect of Norway, an intensely expressive picture of a preacher addressing peasants, the preacher standing on a stool, with a flood of light pouring through the opening in the roof of the cottage on his pale and mystic face; likewise 'Sunday Afternoon': both from the National Gallery, Christiania. The best of all the pictures we know by this fine designer is 'Visit to a Neighbour's Wife,' belonging to Mr. C. Cowan. Lord Ellesmere has a hardly inferior work, 'Farewell.' We have not forgotten 'Catechization by a Schoolmaster in a Norwegian Country Church,' a picture rich in quiet humour, and varied in expression. It is one of ten illustrations of epochs in the life of a Norwegian peasant, painted in the palace at Oscarsholm, belonging to the King of Sweden. Mr. Morrison possesses an intensely dramatic 'Combat in Ancient Norway.' 'A Norwegian Funeral during the last Century' is a highly pathetic piece, where, as is frequently the case with the artist, the landscape is employed with great success to aid the pathos of the picture. Another important work by Tidemand is 'Distribution of the Sacraments to Aged and Infirm Lutherans.' His distinguishing

characteristic as an artist was national; no one could hesitate to recognize his pictures as essentially Scandinavian; and, although Düsseldorf may boast that it trained him, his best qualities were those most emphatically opposed to the teaching and example of the school of that place; good, careful, learned work there is in them, but very little that is conventional or scholastic. Tidemand's art resembled that of the Düsseldorf school in the crudity of its colouring and some opacity; but, unlike the products of the school, it was never coarse, heavy, dull. Deep religious sentiment, strongly marked character, variety of incident, profound feeling with simplicity, an entire absence of sentimentality, and a vein of humour frequently displayed, were the leading elements of the genius of this admirable designer and excellent painter.

THE death of M. C. F. Kiorboe, a Swedish animal painter, took place last month at Dijon. He was born at Stockholm, and became a pupil of M. Henning. He obtained a medal of the third class in Paris, 1844; a second-class medal in 1846. He resided in France for more than half a century; and, in 1860, received the *cordon* of the Legion of Honour. His paintings were well known in England, and remarkable for the vigour of their designs, the knowledge of animal nature they exhibited, and for some roughness in their execution. He was most successful with dogs.

It is stated that the committee appointed to superintend the erection of the monument to Léopold Robert in the cemetery of the Lido, Venice, has decided to adopt the plans of M. W. Mayor, architect, of Neuchâtel, who has produced what is described as a very satisfactory design, comprising a pyramid of coloured granites of Berne, to be placed against the wall of the cemetery, and bear a medallion portrait in bronze by M. F. Landry, of Neuchâtel. The inscription is to be, "A Léopold Robert ses Amis." On the lower portion of the pyramid are to be placed the dates of the birth and death of the painter, "1794-1835." At the foot of the composition a sarcophagus of grey granite is to stand, "décoré de la reproduction fidèle de la palette de Léopold Robert, conservée au musée de Neuchâtel," accompanied by a palm. On the sarcophagus will be carved a large four-leaved flower—an emblem of immortality. Such are the leading points in the description of this work in *L'Union Libérale*, journal of Neuchâtel. Looking critically at the description, it may be safely said that the merit or demerit of the tomb must depend on the greater or less beauty of the proportions of its parts. It seems to be one of those works which will owe all to the skill and severe taste of the artist, or be ruined by his not possessing them. The design aims at nothing which is picturesque or suggestive of sentiment, except so much as may be gained from the emblematic sculptures.

MUSIC

THE HEREFORD MUSICAL FESTIVAL.

"It would be a national disgrace if the Three Choir Festivals should be given up," observed a Roman Catholic, an eminent musician, who, apart from his own creed, considers that the Festivals have tended to the improvement of religious services in this country. And there are many sects—many Nonconformists—who sing to the praise and glory of God, and regard the practice and development of music as civilizing, and as more calculated to develop human sympathies on behalf of suffering humanity, and to promote kindly feelings, than dry disquisitions which are sometimes designated sermons. If music be destined to decline, cathedrals, churches, and chapels will fall; but if the science of sweet sounds is to have preponderating influence, it is evident that the works of the master-minds must be periodically presented in massive proportions. It is not in these columns that the question can be entered into what were the motives

which prompted the insane attempt at Worcester of last year to close the performances of more than a century and a half with a mock festival, and to add to the customary single sermon other sermons. "What can be more annoying," said a distressed amateur, to Cherubini, "than a solo on the flute?" "Two flutes," rejoined the canonic composer; and if it be asked, "What can be duller than a sermon ill conceived and ill delivered?" "Two sermons," would be the natural reply. It is to the honour, then, of the Dean of Hereford that he has taken an enlightened view of the art-question, as bearing on religious worship as well as on the cause of charity—to the honour of the Bishop of the Diocese that he has preached the sermon—to the honour of the noblemen and gentlemen, and all classes of the community, that they, the men of Herefordshire, have come forward and have emphatically declared that the Three Choir Festivals shall not die, because a few very narrow-minded and very bigoted divines have thought that their position would be elevated if artists were depreciated. And so the 153rd meeting of the Three Choirs has taken place, and with more than ordinary success, artistic and financial.

Besides sacred works familiar to the lovers of oratorio and devotional cantata, the oratorio of perhaps our best young composer has been produced, namely, 'The Raising of Lazarus.' It may be remembered that this work was first heard in St. James's Hall in 1873, and that a notice of it appeared in the *Athenæum*. The main objection is that it illustrates only one miracle in the career of the Saviour, and that the accomplishment of the resurrection is tediously delayed, and that when the resuscitated Lazarus does come out of the tomb, other characters are permitted to express their emotions before he who has the title-part is allowed to sing in glorification of his restoration. Moreover there are didactic recitatives of a tedious kind; there are repetitions of jubilant strains; and there are reiterated declarations of faith. In fact, the machinery of the Greek chorus is too prominent; there is a lack of incidents, of variety of treatment, of soul-stirring effects. With all these drawbacks, if the oratorio were weeded, the materials for an interesting cantata could be secured. The workmanship of the musician is admirable; his orchestration is full of fine points; he voices generally well, although at times he taxes his chief singers too much. The choruses, "Blessed are they," and the "Give glory," the *finale* of both the first and second parts indicate power; but generally his style is not decidedly pronounced; reminiscences have haunted him, memory is too prevalent over fancy and imagination, and types of his predecessors are unmistakably recognized. But it will not do to lose confidence in Mr. J. F. Barnett. If he has not fulfilled the promises of his 'Ancient Mariner,' that fine setting of Coleridge's poem, he has years before him to realize the expectations raised by that work, and he has to atone for the disappointment caused by his 'Paradise and the Peri' and his 'Good Shepherd.' He must be more cautious in the selection of his subjects for notation; for he has made three mistakes, redeemed by one triumph. Still, as we have said, there is every reason to hope much from a composer who has exhibited force and vitality. By Mdle. Tietjens, Madame Trebelli-Bettini, Mr. Cummings, and Mr. Lewis Thomas he was more or less aided, but it would be idle to say that Mr. Santley, the Lazarus of 1874, was not missed.

The other novelty in the week's programme was the St. Cecilia Mass of M. Gounod, in G, so often eulogized in these columns, and which, heard within the walls of a cathedral, was still more interesting and impressive. The solo singers were Madame Edith Wynne, Mr. Cummings, and Mr. Maybrick. The "Credo," "Sanctus," and "Agnus Dei" were magnificent; the orchestral introduction and offertorium were splendidly played.

There was one drawback, however, to the Festival, arising out of that miserable discussion about pitch, in which mathematicians, musicians, instrumentalists, and vocalists are

totally at issue. What has been the result of this diapason dispute? Confusion and discord. What happened at the Birmingham Festival the week before last has been recorded in the *Athenæum*, and the same result of tuning an organ to a tenor tuning-fork has happened at Hereford. The temporary organ (the choir organ is too far off the west window where the orchestral platform was erected) was tuned to meet the whim of Mr. Sims Reeves, and the organ was nearly a full tone below the orchestral pitch. For the instruments to tune to this flat degree was of course impossible; the poor organist (Mr. Done, of Worcester) has been in despair; the choir at sixes and sevens at times, —and all this because we have not in England a power like Imperialism to establish a universal pitch. Under these circumstances, common sense and the ear tell us to leave the accepted diapason of the country alone, not to meddle and muddle it; and singers who fancy that their voices will be destroyed by the high pitch had better retire, or, what would be much more just and reasonable, accommodate themselves to it. What cannot be cured must be endured, and excitable vocalists had better bear in mind the proverb.

The week's meeting has been remarkable for the large attendance of the leading amateurs of Worcester and Gloucester, and for the presence of the mayors and municipalities of the three cathedral cities at the inauguration of the meeting. Moreover, the Bishop of Hereford has preached the sermon. The manifestation of public feeling in favour of the continuance of the Three Choir Festivals has been enthusiastic, and strongly condemnatory of the proceedings last year of the Dean and Chapter of Worcester. It is, however, confidently expressed that the mock Festival of 1875 will never be repeated; it is the turn of Gloucester next year, and preparations are already being made to render the 154th gathering as successful as the present one at Hereford. The collections for the diocesan charities have been unusually large. The best performances, up to Thursday, were the 'Last Judgment' of Spohr, and the 'Lobgesang' of Mendelssohn. Mr. Sims Reeves could not sing on the first two days, but was expected to appear in the 'Messiah' yesterday.

Musical Gossip.

THE Lyceum Theatre was opened last Monday night, under the direction of Mr. Carl Ros, with Cherubini's 'Deux Journées,' called here 'The Water-Carrier.' A full notice of this fine work appeared in the *Athenæum*, when the English version was produced at the Princess's Theatre last year. The present cast is much the same; Mesdames Torriani, Gaylord, and Graham; Messrs. Nordblom, A. Cook, C. Lyall, Celli, A. Howell, and Santley. Mr. Carl Rosa conducted, and received a cordial welcome; the leading artists were also recalled and much applauded. Of Sir Julius Benedict's new arrangement of the 'Lily of Killarney,' and of the *debut* of Mdle. Ida Corani in the 'Sonnambula,' we shall speak on a future occasion. Adolphe Adam's 'Giralda' is underlined for the earliest novelty.

THE Alhambra will shortly produce a comic and spectacular opera, the music by Mr. Frederic Clay, the libretto by Mr. Maltby and Mr. H. Paulton, founded on 'Don Quixote.'

A WORK, entitled 'Musical Myths and Facts,' by Herr Carl Engel, and comprising essays on the Art of Music, on Musical Instruments, Folk-songs, &c., is now in the press, and will shortly be issued by Messrs. Novello & Co.

M. SALVAYRE has composed the music for the new ballet, 'Le Fandango,' in preparation at the Grand Opéra in Paris.

THE opera by M. Joncières, 'Dimitri,' continues to be favourably received at the Lyrique in Paris; Weber's 'Oberon' has been revived, with M. Michot in the tenor part, Sir Huon; Mdle. Salla as Rezia, and Mdle. Sablailrolles, Fatima; M. Planche's libretto has been freely translated; the

earliest novelty will be 'Paul et Virginie,' by M. Victor Massé.

The 'Lalla Rookh' of the late Félicien David will be revived at the Paris Opéra Comique, and his 'Perle du Brésil' at the Lyrique.

M. MUZIO, the conductor of the Théâtre Italien, in Paris (Salle Ventadour), has commenced the rehearsals of Signor Verdi's 'Forza del Destino,' which will be the opening opera.

The last "Meistersinger" of Nuremberg, Herr Best, died lately at Ulm, in his eighty-sixth year. He was a gravedigger.

M. TOURNIÉ, the tenor who sang at the Gaiety Theatre last year, has appeared as Raoul in the 'Huguenots,' at the Théâtre de la Monnaie in Brussels. There was another *début*, Miss Jenny Howe (American), who appeared as Valentine. Her voice was admired, but she requires stage experience.

THE two Imperial Opera-houses in Berlin and in Vienna have been reopened, with Herr Wagner's 'Tannhäuser.' In choosing an opera from the 'Nibelungen,' both the Prussian and Austrian theatres have decided in favour of the 'Walküre,' but the libretto is to be materially altered and shortened. Several German papers have been forwarded to us which contain strong articles against the Trilogy; but as the opinions of our Teutonic contemporaries are an echo of the series of five notices which have appeared in the *Athenæum*, it is scarcely necessary to quote the protests which are directed against the vocal system of Herr Wagner, and the mode in which he has treated the Scandinavian legends.

HERR RUBINSTEIN'S opera, 'The Maccabees' ('Judas Maccabæus'), so successful at Berlin, is to be produced in St. Petersburg at the Russian Imperial Opera-house.

DRAMA

THE WEEK.

MARKET.—'Dan'l Druce, Blacksmith,' a Drama, in Three Acts. By W. S. Gilbert.
COURT.—'Evel's Revenge,' a Play, in Four Acts.—'A Subsidite,' a Comedietta, in One Act. By James Payn.

It scarcely detracts from Mr. Gilbert's claim to originality, to assert that his drama of 'Dan'l Druce, Blacksmith,' recalls many previous works. If originality is only to be accorded those who are altogether independent of their predecessors, it must be denied a host of writers, commencing with Boccaccio, and including Shakspeare, Molière, and Goethe. It may, we think, be maintained that a story belongs rather to the man who turns it to best account, than to him who first employs it; and it is certainly a defensible assertion that those dramatists who have taken most from other sources have done the best work. Invention itself is as rare a gift as dramatic perception, and the two are seldom found in conjunction. The dramatist, then, with whom invention is not superabundant, may do well to draw upon accumulated stores of intrigue and incident, instead of cudgelling his brains to produce new combinations. A rather strange medley of works is suggested by the new drama. The leading idea, that of masculine hard-heartedness subjugated by infantine innocence or virginal purity, animates a score of works between the 'Ursule Mirouet' of Balzac and Bret Harte's 'Luck of Roaring Camp.' 'Timon of Athens' suggests the opening situation; that which follows is taken from 'Silas Marner'; while the antagonism of classes, the seduction by a man of position and fashion of the wife of a blacksmith, has been anticipated in 'Used Up.' Besides these resemblances, and others

which are more remote, there is a certain measure of that form of plagiarism most pardonable in an author—imitation of his own previous works. Dorothy, Mr. Gilbert's youthful and very attractive heroine, has some likeness to those types of superhuman innocence and purity he has drawn from fairy legend.

So purely domestic is the interest of the play, there is no obvious reason for giving it the historical background Mr. Gilbert has assigned it. A certain appearance of insincerity must always attend effort to reproduce the life of past ages. Mr. Gilbert is too thorough an artist to fall into the mistake of attempting to restore the exact phraseology of our ancestors. A certain kind of instinct appears to guide all writers who have obtained success in the attempt to deal with the life of past epochs. Influenced by this, they give a conventional tone of antiquity rather than a reproduction. This is altogether in accordance with the precedent of the stage, whereon all things have to be judged from a standard impossible in real life; and calculations have to be based upon the supposition that an action will be seen framed as in a picture. The characters accordingly talk so as to be completely intelligible to modern ears, while an antiquated air is still communicated to their speech. In one case only does Mr. Gilbert attempt an absolute imitation of the language of the seventeenth century. In Reuben Haines, a Cavalier sergeant, it is sought to exhibit a type of the swash-buckler, roistering, licentious, pragmatical, full of airs, and ever ready with a quip. The language used by this character has thus a stamp of antiquity not elsewhere to be found.

The story leads to situations which, in spite of an appearance of strength, cannot be said to possess any true dramatic grip. The chief grace of the play is in one or two very tender and idyllic passages of love-making introduced into the second act. What interest attends the later scenes makes strong demands upon the readiness of the spectator to be deceived, seeing that a misunderstanding between the lovers, which forms the basis, could not in the world of absolute fact have remained a moment without explanation. The same charge may be advanced against some of the greatest plays the world has seen. By the exercise of a very small amount of common sense, Othello would have broken through the flimsy, if fatal, web in which Iago had wrapped him. In 'Dan'l Druce' Mr. Gilbert has attempted a more elaborate study of human nature than he has previously essayed. Soured by the loss of his wife and child, the former of whom has eloped with an aristocratic lover, the blacksmith, under an assumed name, has gone to reside in a lonely and wind-rocked cabin on the Norfolk coast. Here he has hardened into a species of miser. Not wholly debased is his nature. He loves his gold as though it were the work of his hands, and, like a second Pygmalion, wishes that his statue would start into life. His desire, absurd as it seems, is answered. A Cavalier officer, hard pressed in his attempt to escape from the result of Worcester's fight, takes his gold, and leaves him a child three years of age. Accepting a boon which he rightly judges heaven-sent, Druce rears the little stranger, and loves her as his own flesh and blood. He

is of course tortured by the fear that she may be reclaimed. She is faithful to him, however, and is in the end proved to be his own child, the offspring of the wife who had quitted his roof. With the development of this character Mr. Gilbert has taken much pains. The change of nature produced by the presence of the girl is carefully depicted, until we see the hard heart completely subjugated by the gentle hand. Some such ascendancy of childhood over the manhood which prepares its way is indicated in 'Macbeth,' where the appearance of the armed head is followed by that of the child—an apparition which the first witch pronounces "more potent than the first." Full justice was done to this conception by Mr. Vezin, who acted with much earnestness and passion, and in the scenes in which he defended his treasure produced a powerful effect upon the audience. The love-scenes of the second act were finely presented by Miss Marion Terry and Mr. Forbes Robertson. Miss Terry's quietude of manner, and her apparent insensibility to the significance of the rough wooing of the Cavalier soldier, Haines, were excellent. Mr. Odell has a strong sense of burlesque humour, but carries his impersonations into caricature. His acting in Reuben Haines was equally droll and extravagant.

'Dan'l Druce' obtained a favourable reception. It adds nothing to Mr. Gilbert's intellectual stature; but it is different from anything he has done, and it is not unworthy of his reputation.

If the taste of the English public is less elevated in matters of dramatic art than that of continental nations, it is less sophisticated also. Attempts to naturalize upon the English stage the adventures as she appears in the drama of M.M. Octave Feuillet, Emile Augier, and Alexandre Dumas, have, as yet, been failures. A version of some Parisian novelty, in which the *entourage* has been distinctly French, has occasionally obtained a sort of acceptance, and characters, in which whatever is unconventional has been toned down, have maintained a brief existence upon the stage. All effort, however, to domesticate the 'Fiammina,' the 'Dalila,' or the 'Fille de Marbre,' has, as yet, miscarried. The heroine of the new drama with which Miss Helen Barry has opened temporarily the Court Theatre is an adventuress of the French school. She has, however, passed through a process of purification, such as generally befalls French creations when they are set before the English public. The effect of this is to render her about as natural and acceptable a being as would be a negro, who, on the strength of a coat of white-wash, attempted to pass off as a European. In the novel of which the play is an adaptation, the 'Strathmore' of Ouida, the heroine, amid all her extravagancies and absurdities, retains a species of consistency. In the play, on the contrary, she is meaningless and preposterous. It is useless to recapitulate at length the incidents of a story that is familiar to all readers of a certain class of modern fiction. Lord Mountsorrel (Cecil Strathmore) falls under the spell of Ethel, Countess of Belmont (Marion, Lady Vavasour and Vaux). In the madness begotten of his passion he slays his best friend, Major Bruce Fortescue (Major Errol). In his penitence, he breaks off abruptly his connexion with the temptress, and pours

upon her the vials of contempt and wrath. In subsequent years he espouses Nathalie (Lucille), the daughter of his victim. Ethel's revenge consists in breaking in upon his nuptial felicity for the purpose of instructing his wife that he is her father's murderer, and in not doing it. That "soul of goodness" which lurks in "things evil" asserts itself, and the opportunity is missed. The title of the play is thus a misnomer. Were this the worst defect in the piece, it might be condoned. All in it, however, suffers from the weakness that is begotten of exaggeration. No one of the characters, except perhaps Nathalie, the *ingénue*, is a recognizable human being acting upon any known or appreciable motive. The plot is a tissue of impossibilities, and the entire machinery is old-fashioned and cumbrous. It would be easy to point out absurdities in the arrangement, such as the introduction of the Gipsy, Ramona (Redempta), who has nothing whatever to do with the action, or in the presentation, such as the swoon of the heroine upon being confronted with her. It is, however, mere waste of time to dwell upon points of weakness in a composition that is wholly invertebrate.

The acting was scarcely more satisfactory than the piece. Miss Barry, who played the heroine, has earnestness and intention. These, however, are the only merits she can claim. Her method is defective, and she strives perpetually to force effects, which can never be obtained by such a process. Mr. Kelly is unable to make anything of the hero, whose only recognizable quality is brutality. Mr. Leathes gives a good picture of *Major Fortescue*, but disappears at the end of the first act. Miss Florence Roberts acts with tenderness and grace as the *ingénue*. An opening farce, by Mr. James Payn, entitled, 'A Substitute,' deals with old and familiar materials, but readjusts them with some dexterity. The humour of the piece—which is absurdly called a *comedieta*—is derived from the efforts to avoid detection of a waiting-maid called upon suddenly to personate a lady of fashion. In this piece Mr. Leathes gave a good representation of an English citizen of an old and convivial type.

Dramatic Gossip.

Mr. J. S. CLARKE has now gone to the Strand, where he is playing in 'A Widow Hunt' and 'The Heir-at-Law,' the pieces in which he last week appeared at the Haymarket.

The Globe Theatre has reopened with Mr. Burnett's version of 'Jo.' Miss Jennie Lee reappears in her well-known character of the crossing-sweeper. The drama is prefaced by a humorous sketch, entitled 'The Way of the Wind,' in which some old-fashioned stage devices are cleverly employed.

'MARCEAU; OU, LES ENFANS DE LA RÉPUBLIQUE,' a drama founded, by MM. Bourgeois and Masson, upon 'La Rose Rouge,' a novel of Alexandre Dumas père, and first acted thirty years ago at the Gaîté, has been revived at the Théâtre Historique. M. Montal played the Republican General. Among other characters introduced are Robespierre, Kléber, Talma, Chénier, and Buonaparte.

The *Revue et Gazette des Théâtres* announces the death of M. Schey, of the Variétés. We assume that this actor is the same with whom the London public has grown familiar.

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